

Ro Bruce

THE
CHINESE TRAVELLER.

CONTAINING
A GEOGRAPHICAL, COMMERCIAL,
and POLITICAL
HISTORY of CHINA.

WITH
A particular ACCOUNT of their

CUSTOMS,
MANNERS,
RELIGION,
AGRICULTURE,
GOVERNMENT,
ARTS,

SCIENCES,
CEREMONIES,
BUILDINGS,
LANGUAGE,
PHYSICK,
TRADE,

MANUFACTURES,
SHIPPING,
PLANTS,
TREES,
BEASTS,
BIRDS, &c. &c.

TO WHICH IS PREFIXED
THE LIFE OF CONFUCIUS,
The celebrated CHINESE PHILOSOPHER.

COLLECTED FROM DU HALDE, LE COMPTE, AND OTHER
MODERN TRAVELLERS.

V O L. II.

ADORNED WITH A MAP OF CHINA, AND OTHER CURIOUS
COPPERPLATES.

L O N D O N:

Printed for E. and C. DILLY in the Poultry.

M D C C L X X I I.

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A GEOGRAPHICAL, COMMERCIAL,
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VOLUME THE FIRST.

A particular Account of their

MANUFACTURES	SCIENCE	CUSTOMS
SHIPPING	CEREMONIES	MANNERS
PLANTS	BUILDINGS	RELIGION
MINERALS	LANGUAGE	LITERATURE
VEGETABLES	MUSIC	OFFICIALS
BIRDS	TRADE	OF THE

TO WHICH IS PREFIXED

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COLLECTED FROM THE COMPTE, AND
MODERN TRAVELLERS.

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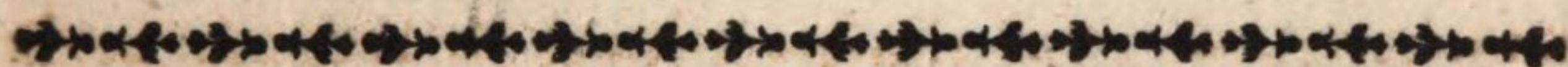
ADORNED WITH A MAP OF CHINA AND OTHER CUTS.

LONDON:

Printed for J. C. D. in the Strand.
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O F
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T H E
CHINESE TRAVELLER.

Of the SKILL of the CHINESE in the SCIENCES.

WHEN we behold the immense number of
W libraries in China elegantly built, beauti-
fully adorned, and furnished with a valua-
ble collection of books; when we consider
the prodigious number of doctors, and colleges esta-
blished in every city throughout the empire, their obser-
vatories, and their steady attention to the motion of
the stars; and when we further recollect, that men are
never preferred but in proportion to their abilities, that
the most exalted dignities are acquired by study alone;
that according to the laws of the empire, none have
been governours of cities and provinces, and have en-
joyed all the offices about the court, but the learned,
for upwards of four thousand years; one would be temp-
ted to imagine, that every nation in the universe
must be extremely ignorant, in comparison of that of
China.

Notwithstanding all this, a long acquaintance with
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them is not necessary to undeceive you; for though it must be owned that the Chinese have a great deal of wit, yet it is not very penetrating, inventive, and searching, nor have any of the speculative sciences, which require subtilty and penetration, been brought to any perfection amongst them.

Yet I would not willingly find fault with their genius, since it is evident that they have performed other things which require as extensive a capacity, and as deep a penetration as the speculative sciences: but their progress in these kind of sciences has two very great obstacles; first, there is nothing within or without the empire to excite their emulation: and secondly, those who are able to distinguish themselves can have nothing to expect as a reward for their performance.

Their principal method of obtaining riches, honours, and offices, is the study of the laws, morality, the canonical books, and history; it is to learn to write in a polite manner, in terms suitable to the subject treated upon; by this means they obtain the degree of doctor; and when that is over they are possessed of such honour and credit, that the conveniencies of life soon after follow, because they are certain of being presently in possession of a government: even those who wait for this post, when they return into their provinces, are very much respected by the Mandarin of the place, their family is protected from troublesome molestations, and they there enjoy several privileges.

But as those who apply themselves to the speculative sciences have nothing like this to hope for, and as the study of them is not the road to honours and wealth, we need not be surpris'd that in China these sort of abstracted sciences should be so much neglected.

Of the CHINESE LOGICK.

LOGICK, which in Europe is much refined, is void of all precepts amongst the Chinese; they are ignorant of defining, dividing, and drawing consequences, and have invented no rules to bring argumentation to perfection; they follow nothing but the natural light of reason; it is by this alone, and without the least assistance from art, that they compare ideas together, and draw just enough consequences.

Of their RHETORICK.

THE Chinese are entirely ignorant of the proper rules to adorn and embellish a discourse, their rhetorick being quite natural; and yet they are not absolutely without, imitation generally serving them instead of precepts: they are satisfied with reading the most eloquent pieces, and observe the strokes that are most likely to affect the mind, and make such an impression as they desire; when they compose any set discourse, they copy these models.

Their eloquence does not consist in a proper arrangement of periods, but in lively expressions, noble metaphors, bold similes, and principally in sentences and maxims extracted from the antient sages, who express themselves in a lively, concise, and mysterious style, comprehending a variety of thoughts, and much sense in a small number of words.

Of their MUSICK.

WERE one to believe the Chinese, they were the first inventors of musick, and who formerly brought it to the greatest perfection. But if what they say is true, they must be greatly degenerated, for it is at this time so imperfect, that it is unworthy of the name.

In former times, it is true, it was in great esteem, and Confucius himself undertook to introduce precepts concerning it in every province, whose government he was intrusted with: The Chinese themselves still are very sorry for the loss of the antient treatises upon musick.

Musick with them is now seldom used but at plays, feasts, weddings, and such-like occasions: it is made use of by the Bonzes at burials, but when they sing they never raise and lower their voice a semi tone, but only a third, a fifth, or an octave, and this harmony is very delightful to the ears of a Chinese. Besides, their concerts have no dependance on the variety of tones, nor the difference of parts, they all sing the air as it is practised throughout the other parts of Asia.

The European musick pleases them vastly, provided the sound of several instruments is accompanied but by one voice: but they look upon the most curious part of musick, viz. the contrast of different voices, of grave and acute sounds, diëses, fugues, and fyncope, as a disagreeable confusion.

They are ignorant of the musical notes and have no signs to denote the diversity of tones, the raising or falling of the voice, and the rest of the variations which constitute harmony: the airs which they sing or play upon their instruments are got only by rote, and are learnt by the ear; notwithstanding which, they fre-

quently compose new ones, and the late emperor Cang hi has made some himself. There is something agreeable even to an European ear in these airs played upon their instruments, or sung by a good voice.

The late emperor Cang hi was greatly astonished at the ease wherewith we retain an air after the first hearing by the assistance of notes. In the year one thousand six hundred and seventy-nine, he sent for F. Grimaldi and F. Pereira to play upon an organ and an harpsicord of which they had formerly made him a present; he appeared to be very much delighted with our European airs; then commanded his musicians to play a Chinese air upon their instruments, and likewise played very gracefully himself.

While the musicians were playing, F. Pereira took his pocket book and pricked down all the tune, and after they had finished, repeated it without missing one note, which surprised the emperor so much that he could hardly believe it. He extolled the harmony, facility, and justness of the European musick; but he admired above all, that the father had so soon learnt an air which had cost him and his musicians so much trouble, and that by the assistance of characters he could recollect it whenever he thought proper.

To be more certain of this he put him to the trial several times, and sung a great many different airs, which the father took down in his book, and repeated exactly with the greatest justness: I cannot but own, said the emperor, that the European musick is incomparable; and the equal of father Pereira is not to be found in all the empire. This prince afterwards established an academy of musick, and made the most skilful persons in that science members of it, and committed it to the care of his third son, a man of letters, and well versed in books. They began by examining

all the authors that had wrote upon the subject, they caused various instruments to be made after the antient manner, and according to the size proposed. The faults of these instruments were discovered and corrected, after which they composed a book in four volumes, called, "The true doctrine of Li lu, written by the emperor's command." They afterwards added a fifth volume to these four, concerning the elements of European musick, of which F. Pereira was the author.

The Chinese have invented eight kinds of musical instruments, which they think to have the nearest resemblance of a human voice; some are of stone, others of metal like our bells, and one among the rest is not unlike our trumpet.

They have also others made of skins like our drums, of which there are various sorts, and some are so ponderous, that it is necessary to support them with a piece of wood before they can be used. They likewise make use of stringed instruments, but the strings are of silk, not gut. Such are the cymbals that the blind people play upon, as also their violins, each of which have but three strings.

They are likewise very fond of an instrument of seven strings, which, when skilfully played upon, is agreeable enough: they have others that consist of nothing but two large boards of wood, which they knock against each other.

Wind-instruments are also in use amongst them, they having two or three kinds resembling our flutes, and a small species of organ, the sound of which is not disagreeable.

Of their ARITHMETIC.

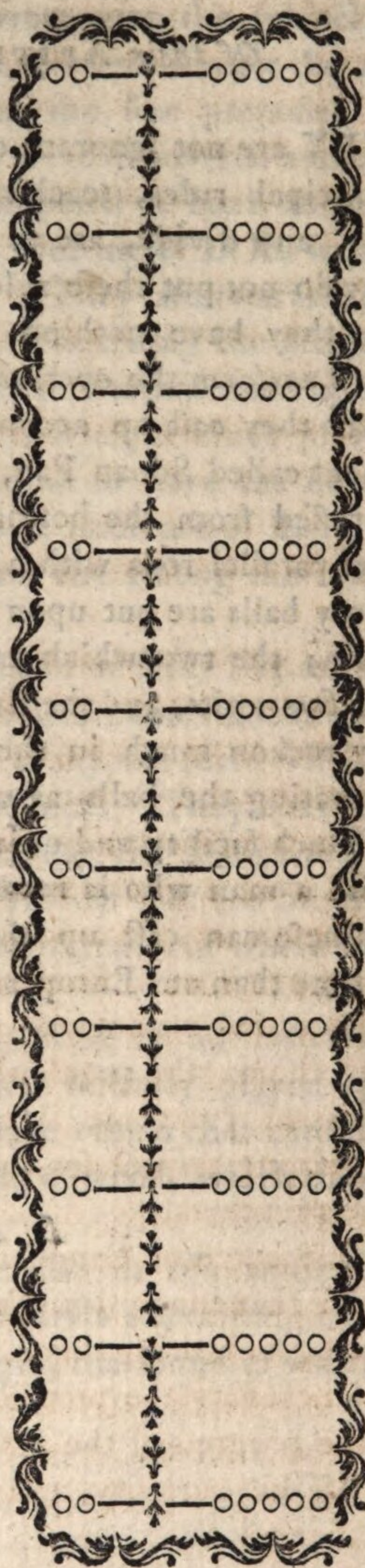
THEY are not ignorant of arithmetic, for the four principal rules, teaching how to add, subtract, multiply, and divide, are to be found in their books. But they do not put these rules in practice by calculation, for they have nothing like our figures whereby they may perform the operation.

When they cast up accounts they make use of an instrument called Souan Pan, which consists of a small board crossed from the bottom to the top, having ten or twelve parallel rods with a separation in the middle; little ivory balls are put upon these rods, which slip up and down; the two which are in the upper one stand each for five units, and the five below for units.

They reckon much in the same manner in joining and separating the balls as we do with counters, but with so much facility and quickness, that they can keep pace with a man who is reading a book of accompts. The Chinese can cast up the most considerable sums in less time than our Europeans with the use of figures.

Souan Pan, or the Instrument used by the Chinese in casting up Accompts.

Peouang leang, or Millions or Tael.	Quan le- ang, or 10,000 of Tael.	Tfien le- ang or 1000 Tael.	Pe leang, or 100 Tael.	Che le- ang, or ten Tael.	Leang, or a Tael, 100 Sous.	Tfien or ten Sous.	Fuen, or a Sou.	Li, or a De- nier.	Hao, or the tenth Part of a Denier.
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Of their GEOMETRY.

THE geometry of the Chinese is superficial enough, for they have but little knowledge either in the theory or practice; if they undertake to solve any problem, it is rather by induction than by any stated rules: however, they are not wanting in exactness in measuring their land, and in settling the extent and bounds; and their method of surveying is very sure and easy.

Of the other Parts of the MATHEMATICS.

TWO centuries ago the Chinese knew nothing of the other parts of the mathematics, and they discovered not their ignorance till the missionaries then first went amongst them.

This nation, naturally proud, reckoned themselves the wisest people in the world, and they quietly enjoyed this reputation, because they were acquainted with no part of mankind so knowing as themselves; but the ingenuity of the missionaries who appeared at court undeceived them: the proof which they gave of their capacity was of great use in authorising their ministry, and in gaining respect for the religion of which they were the preachers.

The late emperor Cang hi, who delighted in nothing more than in acquiring knowledge, was never tired of seeing or hearing them: and the Jesuits, perceiving how necessary the protection of this great prince was to the progress of the gospel, omitted nothing that might raise his curiosity, and satisfy this natural relish for the sciences.

In order to give him an insight into opticks, they

presented him with a semi-cylinder of a light kind of wood; in the middle of its axis was placed a convex-glass, which, being turned towards any object, painted the image within the tube with the utmost nicety.

So unusual a sight pleased the emperor much, and he desired to have a machine made in his garden at Peking, wherein he might behold every thing that passed in the streets and neighbouring places, without being seen himself.

Obedient to the emperor's command, they procured for this purpose an object-glass of much greater diameter, and made in the thickest garden-wall a large window in the shape of a pyramid, the basis of which was towards the garden, and the point towards the streets: at the point they fixed the glass-eye over against the place where there was the greatest concourse of people; at the basis was made a large closet, shut up close on all sides, and very dark.

The emperor frequently came with his queens to this place, to observe the lively images of every thing that passed in the streets; and this sight vastly delighted him, but the princesses much more, who could not otherwise behold this spectacle, the custom of China not suffering them to stir out of the palace.

F. Grimaldi gave another surprising spectacle by his skill in opticks in the Jesuits garden in Peking, which vastly amazed the nobles of the empire. They made upon the four walls four human figures, every one being of the same length as the wall, which was fifty feet. As he had perfectly observed the optick-rules, there was nothing seen on the front but forests, mountains, chaces, and other natural things; but at a certain point they perceived a well-proportioned and well-made figure of a man.

The emperor honoured the Jesuits house with his presence, and beheld these figures a long time with admiration; the grandees and principal Mandarines, who came in crowds, were equally surpris'd; but that which struck them most was to see the figures so regular and so exact upon irregular walls, that in several places had large windows and doors.

It would be too tedious to mention all the figures that seem'd in confusion, and yet were seen distinctly at a certain point, or were put in order with conick, cylindrick, pyramidical mirrors, and the many other wonders in opticks that F. Grimaldi discovered to the finest genius's in China, and which rais'd their surprize and wonder.

In catoptricks they presented the emperor with all sorts of telescopes, as well for astronomical observations, as for taking great and small distances upon the earth; and likewise glasses for diminishing, magnifying and multiplying: among other things they presented him with a tube made like a prism, having eight sides, which, being placed parallel with the horizon, presented eight different scenes, and so lively that they might be mistaken for the objects themselves; this being join'd to the variety of painting entertained the emperor a long time.

They likewise presented another tube whereon was a polygon-glass, which by its different faces collected into one image several parts of different objects, inso-much that instead of a landskip, woods, flocks, and a hundred other things represented in the picture, there was seen distinctly a human face, or some other figure very exact.

There was also another machine which contained a lighted lamp, the light of which came through a tube, at the end whereof was a convex-glass, near which se-

veral small pieces of glass painted with divers figures were made to slide: these figures were seen upon the opposite wall of a bigness in proportion to the distance of the wall; this spectacle in the night-time, or in a very dark place, frightened those who were ignorant of the artifice, as much as it pleased those who were acquainted with it: on this account they have given it the name of the Magick-lanthorn.

Nor was prespective forgotten, F. Bruglio gave the emperor three draughts wherein the rules were exactly kept; he shewed three copies of the same in the Jesuits garden at Peking; the Mandarines, who flock to this city from all parts, came to see them out of curiosity, and were all equally struck with the sight: they could not conceive how it was possible on a plain cloth to represent halls, galleries, porticoes, roads and alleys that seemed to reach as far as the eye could see, and all this so naturally, that at the first sight they were deceived by it.

Statics likewise had their turn: they offered the emperor a machine, the principal parts of which were only four notched wheels and an iron grapple; with the help of this machine a child raised several thousand weight without difficulty, and stood firm against the effort of twenty strong men.

With relation to hydrostaticks, they made for the emperor pumps, canals, syphons, wheels and several other machines proper to raise water above the level of the spring; and among others a machine which they made use of to raise the water out of the river, called The ten thousand springs, and to carry it into the ground belonging to the emperor's demesns, as he had desired.

F. Grimaldi made a present likewise to the emperor of a hydraulick machine of a new invention; there

appeared in it a continual Jet d'Eau, or cascade, a clock that went very true, the motions of the heavens, and an alarm equally just.

The pneumattick machines also did not less excite the emperor's curiosity: they caused a waggon to be made of light wood about two foot long, in the middle of it they placed a brasen vessel full of live coals, and upon that an *Æolipile*, the wind of which came through a little pipe upon a sort of a wheel made like the sails of a wind-mill; this little wheel turned another with an axle-tree, and by that means set the waggon in motion for two hours together: but lest room should be wanting to proceed constantly forward it was contrived to move circularly, in the following manner.

To the axle-tree of the two hind wheels was fixed a small beam, and at the end of this beam another axle-tree, which went through the center of another wheel somewhat larger than the rest; and according as this wheel was nearer or farther from the waggon it described a greater or lesser circle.

The same contrivance was likewise fixed to a little ship with four wheels; the *Æolipile* was hid in the middle of the ship, and the wind proceeding out of two small pipes filled the little sails, and made it wheel about a long while; the artifice being concealed there was nothing heard but a noise like a blast of wind, or like that which water makes about a vessel.

I have already spoken of the organ which was presented to the emperor, but as this was defective in many things F. Pereira made a larger, and placed it in the Jesuits church at Peking: the novelty of this harmony charmed the Chinese, but that which astonished them most was that this organ played of itself Chinese as well as European airs, and sometimes both together.

It is well known, as I have elsewhere mentioned,

that what gave F. Ricci a favourable admission into the emperor's court was a clock and a striking-watch of which he made him a present; this prince was so much charmed with it that he built a magnificent tower purposely to place it in, and because the queen-mother had a desire for a striking-watch the emperor had recourse to a stratagem to disappoint her, by ordering the watch to be shewn her without taking any notice of the striking part, so that she not finding it according to her fancy sent it back.

They did not fail afterwards to comply with the emperor's taste, for great quantities of curious things were sent out of Europe by Christian princes, who had the conversion of this great empire at heart, insomuch that the emperor's cabinet was soon filled with rarities, especially clocks of the newest invention, and most curious workmanship.

F. Pereira, who had a singular talent for music, placed a large and magnificent clock on the top of the Jesuits' church; he had made a great number of small bells in a musical proportion, and placed them in a tower appointed for that purpose; every hammer was fastened to an iron wire, which raised it, and immediately let it fall upon the bell: Within the tower was a large barrel, upon which Chinese airs were marked with small spikes; immediately before the hour the barrel was disengaged from the teeth of a wheel, by which it was suspended and stopt; it then was instantly set in motion by a great weight, the string of which was wound about the barrel, the spikes raised the wires of the hammers, according to the airs of the tune, so that by this means the finest airs of the country were heard.

This was a diversion entirely new both for the court and city, and crowds of all sorts came constantly to

hear it; the church, though large, was not sufficient for the throng that incessantly went backward and forward.

There was no extraordinary phænomenon, such as a parhelion, rainbows, &c. appeared in the heavens, but the emperor immediately sent for the missionaries to explain the causes of them: They composed several books concerning these natural appearances, and to support their explanations in the most sensible manner they contrived a machine to represent the effects of nature in the heavens.

It was a drum made very close and whitened on the inside; the inward surface represented the heavens; the light of the sun entering through a little hole, passed through a triangular prism of glass, and fell upon a polished cylinder; from this cylinder it was reflected upon the concavity of the drum, and exactly painted the colour of the rainbow.

From a part of the cylinder, a little flattened, was reflected the image of the sun; and by other refractions and reflections were shewn the Haloes about the sun and moon, and all the rest of the phænomena relating to celestial colours, according as the prism was more or less inclined towards the cylinder.

They made a present likewise to the emperor of thermometers to shew the several degrees of heat and cold, to which was added a very nice Hygrometer to discover the several degrees of moisture and dryness: It was a barrel of a large diameter, suspended by a thick string made of cat-gut of a proper length and parallel to the horizon; the least change in the air contracts or relaxes the string, and causes the barrel to turn sometimes to the right, sometimes to the left, and stretches or loosens to the right or left upon the circumference of the barrel a small string, which draws a little pendulum,

and marks the several degrees of humidity on one, and on the other those of dryness.

All these different inventions of human wit, till then unknown to the Chinese, abated something of their natural pride, and taught them not to have too contemptible an opinion of foreigners; nay it so far altered their way of thinking, that they began to look upon the Europeans as their masters.

Of their ASTRONOMY.

WITH respect to astronomy they always thought themselves the most skilful in the world, and it must be owned that there is no nation whatever that has applied more constantly to it; the Chinese have made observations in all ages, and even in the infancy of the empire; they have always appointed persons to watch the heavens night and day, insomuch that it has been at all times one of the principal employments of the learned.

Their attention in examining the course of the stars is a proof that they have retained a great deal of the manners of the primitive Hebrews, whose immediate descendants they are supposed to be, they having peopled China a short time after the deluge.

Their attention to observations was looked upon as a thing so important, that the laws even punished with death the negligence of those to whom the state had entrusted this employment, which appears from one of their ancient books, entituled, Chu king. Yn, general of the troops of Tchong kang speaks in the following manner.

“ It is necessary to relate the excellent instructions
 “ given us by the grand Yu. According to these in-
 “ structions the ancient princes, who first settled the

“ form of government, have been successful, because
 “ they were attentive to the will of heaven, and con-
 “ formed themselves thereto in their conduct, the mi-
 “ nisters that came after them having no other views
 “ but those of virtue: We see at present Hi and
 “ and Ho plunged in wine and debauchery, paying no
 “ regard to ancient customs, and being entirely for-
 “ getful of their duty: The first day of the moon,
 “ which was at the same time the autumnal equinox,
 “ there was an eclipse of the sun at eight in the morn-
 “ ing in the constellation Fang [Scorpio] and Hi and
 “ Ho pretended they knew nothing at all of it. Our
 “ ancient emperors severely punished those whose bu-
 “ siness it was to examine the celestial motions, and
 “ did not exactly foretel them: It is written in the laws
 “ handed down to us, that if the time of a celestial
 “ phænomenon is not set down in the calendar, or is
 “ not foretold, such neglects ought to be punished with
 “ death.”

It is easy to perceive that these princes, which he
 calls ancient, must have lived a long while before Yao
 and Chun, whose cotemporary he was: If these ancient
 emperors made such rigid laws against negligent mathe-
 maticians we must suppose the empire was pretty well
 established: This eclipse has been verified by several
 mathematicians among the Jesuits, and it was such an
 one that it could not appear in any other country but
 China, or places beyond it.

The exactness wherewith Confucius has given an
 account of the eclipses, is sufficient to make us regret
 the loss of several things of this kind in the first ac-
 counts of this nation, whence it would appear how
 much the Chinese have always had at heart every thing
 that might give posterity a certainty of the exactness of
 their history.

Of the thirty-six eclipses of the sun, related by Confucius, there are but two false and two doubtful; all the rest are certain.

Several Europeans, not willing to trust their accounts, have satisfied themselves of the truth by their own calculations: F. Adam Schaal has calculated and verified the eclipse of Tchong kang, which happened two thousand one hundred and fifty five years before Christ, and likewise calculated several of Tchun tsiou, which calculations he caused to be printed in Chinese.

The observation of the eclipse of the sun in the year two thousand one hundred and fifty five before Christ is found in Chu king, as F. Gaubil observes, and as the interpreters unanimously assure us, who wrote an hundred years before the Christian æra.

The eclipse of seven hundred and seventy six years before Christ is in the text of Chi king in the astronomy of the Han, and in the text of the history. The observations of Tchun tsiou are in the book, and in the commentaries made by the authors who lived very near the time of Confucius: The greatest part of these eclipses are also in the text of the Chinese history.

As for the greatest part of the other observations, they are taken from the texts of the history made in the time of the dynasties under which the observations were made; they are also in the astronomy composed in the time of these dynasties, and all this is in the great Chinese history, called Nien y fse.

I am certain of the terms of the Chinese astronomy, continues F. Gaubil, I was well acquainted with the forms of the year, as also the cycles, and the Chinese days; I have found a great many observations corresponding with those of Europe and Asia; I have verified, by calculation, a great number of observations,

and by that means I found that they were observations in reality, and not calculations made afterwards, at least for the generality; and what more can be required to verify an epocha? Nay, what have those done more who have examined the eclipses mentioned by Herodotus, Thucydides, Plutarch, Dion? &c.

To these testimonies, which sufficiently prove the antiquity of the Chinese astronomy, I shall add the remarks of F. Gaubil, who made it his particular study, and who since his arrival in China was desirous of being well acquainted with the skill of the ancient Chinese in matters of this nature: I shall give you his own words in two letters addressed to F. Souceit, which are found in the new volume of astronomical observations published by this father in the year 1729.

You have the state of the Chinese heavens, says F. Gaubil, made more than an hundred and twenty years before Christ; you have the number and extent of their constellations, and what stars then answered the solstices and equinoxes, and this by observation; you have also the declination of the stars, the distance of the tropics and the two poles.

The Chinese were acquainted with the motion of the sun and moon from west to east, and likewise of the planets and fixed stars, though they did not determine the motion of the latter till four hundred years after Christ; they also had a knowledge of the solar and lunar months, and have given Saturn, Jupiter, Mars, Venus, and Mercury revolutions very near ours; but they have not a thorough knowledge of the rules of retrogradation and the stations; yet as well in China as Europe some have made the heaven and planets revolve about the earth, and others have supposed that they move about the sun; but the number of the lat-

ter is small, and this opinion is not found unless in the writings of some particular persons.

I am not yet very certain, continues P. Gaubil, of the method used by the Chinese in the calculation of eclipses; but I know that they expressed particularly the quality of the eclipses, the ecliptical bounds, the visibility, &c. These accounts were written above an hundred years before Christ, and since that time the calculation of eclipses has been pretty exact, but the numbers are obscure, and they are understood but by few of the Chinese themselves.

F. Kegler, president of the tribunal of mathematics, has an old Chinese map of the stars, made long before the Jesuits gained a footing in China; the Chinese had marked therein the place of the stars invisible to the naked eye, and they are found with telescopes to be exactly placed, regard being had to the proper motion of the stars.

Since the dynasty of Han, who reigned before the coming of Christ, there have been several treatises of astronomy, and by the reading of these books one may judge that the Chinese have been pretty well acquainted, for above two thousand years, with the length of the solar year of three hundred and sixty five days and almost six hours, that they have known even the diurnal motion of the sun and moon, have understood the method of taking the meridian altitudes of the sun by the shadow of a gnomon, and have well enough calculated, by the length of the shadow, the height of the pole and the declination of the sun; they have likewise known sufficiently exact the right ascension of the stars, and the time of their passing by the meridian; how the same stars in the same year rise or set with the sun, and how they pass by the meridian sometimes at the rising and sometimes at the setting of the sun; they

have also given names to the stars, and have divided the heavens into different constellations, by which they could trace the place of the planets, and distinguish them from fixed stars: In short, concludes F. Gaubil, the reading of the Chinese history demonstrates that they have always had in China the knowledge of many things in astronomy.

If any credit may be paid to their history, it is above four thousand years since they established a solar cycle, or revolution for the supputation of their annals, not unlike the olympiads of the Greeks: This cycle consists of sixty years, and is among them a sort of an age to regulate their histories.

We are informed by F. Nicholas Trigault, who went into China in 1619, and who read upwards of an hundred volumes of their annals, that the celestial observations of the Chinese began not long after Noah's flood, and that they made these observations not like us, by hours and minutes, but by whole degrees; that they have observed several eclipses, with the hour, day, month, and year on which they happened, but neither the duration nor the quantity of obscuration; that in short they have much better observed comets and new stars than the Europeans themselves: All these observations, as well of eclipses as comets and conjunctions, are very serviceable in ascertaining their chronology.

There are three hundred and sixty five days, and somewhat less than six hours, in their year, and from an epocha regulated by the winter solstice, which was the fixed point of their observations, as the first degree of Aries is of ours, reckoning from a hundred to a hundred degrees, they calculated the motions of the planets, and adjusted all things by æquation tables; some imagined that they received them from the Ara-

bians, who entered with the Tartars into China; they had a long time before the science of numbers, under which they veiled their political secrets, which they taught the princes: They had long since an observatory on the top of a high mountain at Nanking, with edifices and instruments proper for observations; all these instruments were of cast brass, and so well made, with regard to the variety of their ornaments, that F. Matthew Ricci, who saw them in 1499, acknowledged he had never beheld any thing like them in any part of Europe; they had been exposed to all the injuries of the weather for two hundred years, and yet were as good as new.

There was a large globe among these instruments, with all the parallel circles and meridians engraved and divided into degrees; it was of such a size that three men could not encompass it, and was supported by a large brazen cube, which opened on one side to give entrance to a man, that he might turn the globe about when the observers required it; the globe served as well for celestial as terrestrial observations, there being neither stars nor countries designed upon it.

There was also a sphere four yards in diameter with its horizon; instead of circles were double rings, representing the usual circles of the sphere, which were divided into three hundred and sixty five, and every degree into the same number of minutes; in the middle of the globe of the earth was a tube which turned whatever way the observer thought proper, to view the stars, and to mark the place on the degrees by the situation of the tube.

The third instrument was a quadrant, raised eight or ten yards upon a stone table, pointing to the north, with a small trough, to discover by the help of water, when the stone was level with the horizon, and the

style at right angles; they were both divided into degrees, to discover, by the means of a shadow, the true points of the solstices and equinoxes.

The largest of these machines was composed of three or four astrolabes, joined together, with moveable rulers and sights to observe with; one, inclined to the south, represented the equinoctial; and the other that crossed it, the meridian; this latter was moveable to direct it at pleasure, as was likewise a third which represented the vertical; the degrees were distinguished by small knobs that the observation might not be hindered by darkness.

The uses of these instruments were written in Chinese characters, with the names of the constellations, which are twenty eight in number, as shall afterwards be shewn, and which answer to our twelve signs; they seem to have been made for the latitude of thirty six degrees.

At Peking there were instruments of the same kind, and probably made by the same hand; they were placed in an observatory of no great consideration on any account. At the entrance into the court there appeared a row of apartments for the lodging of those who were concerned in the observations; on the right was a narrow staircase leading up to a square tower, like to those wherewith they formerly fortified the city walls, which was joined on the inside to the walls of Peking, and raised ten or twelve foot above the rampart. It was upon the platform of this tower that the Chinese astronomers placed their machines, for which there was but just room.

F. Verbiest having judged them useless for astronomical observations, persuaded the emperor to take them away to place others in their stead of his own contrivance; the machines are to this day in a hall adjoining to the tower, buried in dust and oblivion.

“ We could only see them,” says F. le Compte,
 “ through a grate; they seemed to us to be large, and
 “ well cast, of a form approaching to our astronomical
 “ rings, this was all that we could discover; however,
 “ they had thrown into a by-court a celestial globe of
 “ brass, about three foot in diameter, of which we
 “ had a nearer view; the shape was a little oval, the
 “ divisions not very exact, and the whole work inar-
 “ tificially executed.

“ They had contrived a gnomon in a low room not
 “ far off; the aperture, through which the rays of the
 “ sun came, was about eight foot above the floor; it is
 “ horizontal, and formed of two pieces of copper,
 “ which may be turned so as to be farther from, or
 “ closer to each other, to enlarge or contract the aper-
 “ ture.”

“ Lower was a table with a brass plate in the mid-
 “ dle, on which was traced a meridian line fift-
 “ foot long, divided by transverse lines which are nei-
 “ ther finished nor exact; all round the table there
 “ are small channels to receive the water, whereby it
 “ is to be levelled; this contrivance was the most to-
 “ lerable of the Chinese inventions, and may not be
 “ useless in a skilful person's hands.”

In the city of Teng fong, of the third order, in the
 province of Ho nan, which is supposed by the Chinese
 to be the middle of the world, because it was in the
 middle of their empire, there is at this time a tower
 to be seen, on the top of which Tcheou cong, the most
 skilful mathematician ever born in China, who lived
 twelve hundred years before the birth of Ptolomy,
 made his observations, passing whole nights in consider-
 ing the rising, motions, and figures of the constella-
 tions.

He made use of a great brass table, placed horizon-

tally, in making his observations, upon which was erected a long plate of the same metal like a style, both being distinguished by degrees to mark the projections of the shadows some days before the solstice, and some days after, with intent to mark the precise point and retrogradation of the sun, which was the only epocha of their observations, as was before observed.

The diligence and assiduity of the Chinese, in making celestial observations, has caused them to set up a tribunal of astronomy, which is one of the most considerable of the empire; and depends upon the tribunal of rights, to which it is subordinate.

This tribunal is obliged to present the emperor with a celestial observation at the end of every forty five days, wherein is set down the disposition of the heavens, the alterations of the air according to the variations of the seasons, with predictions of diseases, drougths, famine, and the days on which there will be rain, wind, hail, snow, thunder, &c. somewhat similar to what our astrologers publish in our almanacs; besides these observations the principal care of this tribunal is to calculate eclipses, and to notify to the emperor the day, hour, and part of the heaven in which the eclipse shall happen, how long it shall last, and how many digits will be obscured.

The emperor must be presented with this account some months before the eclipse happens, and China being divided into fifteen large provinces, these eclipses must be calculated according to the longitude and latitude of the chief city in every province, and a type thereof must be sent throughout the whole empire, because an account must be given of every thing in a nation of so great curiosity, and so very attentive to these phenomena.

The tribunal of rites, and the Colao, keep these ob-

servations and predictions, and take care to send them throughout the provinces and cities of the empire, to be there observed in the same manner as at Peking; the following is an account of the ceremonies observed on this occasion.

Not many days before the eclipse happens, the tribunal of rites causes to be fixed up in large characters, and in a public place, the day, hour, and minute that it will commence, in what part of heaven it will be seen, how long it will last, when the planet will be totally darkened, how long it will continue so, and when it will be free from total darkness.

It is necessary also to acquaint the Mandarines of all orders, that they may appear, according to custom, in their proper habits, with the ensigns of their dignity, in the court of the tribunal of astronomy, to wait for the moment that the eclipse shall begin; they have all great tables whereon the eclipse is designed, and they employ themselves in considering these tables, and in reasoning together upon the eclipses.

As soon as they observe the sun or moon begin to be darkened, they fall on their knees and beat the ground with their forehead; at the same time is heard a dreadful rattling of drums and kettle-drums throughout the city, according to the ridiculous persuasion the Chinese formerly had, that by this noise they assisted the sun or moon, and prevented the celestial dragon from devouring such useful planets.

Though the learned and people of quality are quite free from this ancient error, and are persuaded that eclipses are owing to a natural cause, yet such a prevalence has custom over them, that they will not leave off their ancient ceremonies; these ceremonies are practised in the same manner in all parts of the empire.

While the Mandarines continue prostrate there are others at the observatory, who carefully examine the beginning, middle, and end of the eclipse, and who compare their observations with the schemes upon them; they afterwards carry these observations signed and sealed, to be presented to the emperor, who likewise observes the eclipse in his palace with the like attention: The same ceremonies are used throughout the empire.

The principal work of this tribunal is the calendar, which is distributed every year throughout the empire: There is no book in the world that passes through so many impressions, nor is published with so great solemnity; there is always at the head the emperor's edict, by which it is forbid, under pain of death, to make use of any other calendar, or publish any other, or to alter any thing therein upon any pretence whatsoever: It is necessary to print several millions of copies, because there is no body in China but is desirous of this book to direct himself by throughout the year.

Three tribunals are set up at Peking to prepare as many calendars as must be presented to the emperor; one of these tribunals is near the observatory; the second, wherein is explained the theory of the planets, and the method of calculating their motions, is a kind of public mathematical school; in a word the third, which is pretty near the emperor's palace, is that wherein all affairs are managed belonging to astronomy, and where they dispatch all the acts belonging to this science.

As there are three tribunals for the mathematics, there are likewise three classes of mathematicians, and formerly the Mahometan astrologers composed a fourth, but now it no longer subsists.

It is the first of these classes which is employed in preparing the calendar, calculating the eclipses of the sun and moon, and in making the rest of the astronomical supputations.

They publish every year three kinds of calendars in the Tartarian and Chinese languages; the smallest of the three is the common calendar, distinguishing the year by lunar months, with the order of the days of every month, the hours and minutes of the rising and setting of the sun, the length of the days and nights, according to the different elevation of the pole in every province, the hour and minutes of the conjunctions and oppositions of the sun and moon, that is the new and full moons, the first and last quarters, called by astronomers the quadratures of this planet, the hour and minute of the sun's entrance into every sign and half sign of the zodiac; for the Chinese, as I have already said, and shall afterwards explain more at large, distinguish the constellations in a manner different from us, and make twenty eight signs of the zodiac, which have their distinct names.

The second calendar contains the motions of the planets for every day in the year, as they are to appear in the heavens: This is a book not unlike Argol's Ephemerides, in which the places of the planets in the heavens are set down to every day, with an exact calculation of the hours and minutes of their motion; they add thereto, for every planet, its distance from the first star of the nearest constellation, and set down the degrees and minutes of this distance; they mention likewise the day, hour and minute of each planet's entrance into every sign, but they mention no other aspects but the conjunctions.

The third calendar is presented to the emperor only in manuscript, and contains all the conjunctions of

the moon with the rest of the planets, and her appulses to the fixed stars, which requires a great exactness of calculation.

For this reason every day and night throughout the year, there are five mathematicians upon the tower, who continually observe the heavens; one attentively considers what passes in the zenith, another turns his eyes towards the east, a third toward the west, a fourth to the south, and the last to the north, that they may be exactly acquainted with all that passes in the apparent parts of the heavens; they are obliged to keep an exact account of every thing that is remarkable, which they present every day to the presidents of the tribunal of mathematics, and by them to the emperor; their observations are set down in writing and figures, with the name and hand of those who made them, and the hour in which they were made.

The Chinese year begins from the conjunction of the sun and moon, or from the nearest new moon to the fifteenth degree of Aquarius, which is, according to us, the sign which the sun enters about the tenth of January, and stays therein till the same day in February; from this point their spring takes its beginning; the fifteenth degree of Taurus is the point which determines the beginning of their summer, the fifteenth of Leo their autumn, and the fifteenth of Scorpio their winter.

They have twelve lunar months, among which some consist of twenty nine days, and some of thirty; every five years they have intercalary months to adjust the lunations with the course of the sun; they divide like us the weeks, according to the order of the planets, to every one of which they assign four constellations, that is one for each day, in such a manner that after the

twenty eight, which succeed each other by seven and seven, they return to the first.

Their day begins like ours at midnight, and ends at the midnight following; but they are only divided into twelve equal hours, each of which contain two of ours; they do not reckon like us by numbers, but by names and particular figures.

They likewise divide the natural day into a hundred parts, and every one of these parts into a hundred minutes, infomuch that its extent is ten thousand minutes, which they observe the more exactly, as they are generally persuaded that there are fortunate and unfortunate minutes, according to the position of the heavens, and the several aspects of the planets; according to them the hour of midnight is happy, because as they imagine the world was created in that hour; they believe likewise that in the second the earth was produced, and that man was formed in the third.

These sort of impostors, who seek only to deceive by means of judicial astrology, and who foretel future events from the situation of the planets and their different aspects, do not fail to gain credit among weak and superstitious minds: They make a distinction of hours which are destined to particular businesses, not unlike our shepherd's calendar, wherein they shew by characters the proper time to let blood, to take physic, shear sheep, cut the hair, undertake a journey, fell wood, sow, plant, &c. they distinguish what time is proper to ask a favour from the emperor, to honour the dead, offer sacrifice, marry, build houses, invite friends, and every thing else relating to public and private affairs; and this is observed so scrupulously by many that they dare do nothing without the direction of the calendar, which they consult as their oracle.

The following is the manner of preparing their prognostications: They take ten characters, which they attribute to the year, each whereof signifies one of the five elements, for they acknowledge that number; they combine these characters in sixty different manners, with the names of the twelve hours of the day; then they consider the twenty eight constellations, which have every one a ruling planet; and from the proprieties of the element, the constellation, and the planet mixed together, they form their conjectures concerning fortunate or unfortunate events; they have whole volumes written about these trifles.

When they were desirous of giving the missionaries the employment of composing the calendar they declined it, at which the emperor seemed greatly surprized: "What!" says he to them, "have not you often said that it was charity towards your neighbour that brought you into these parts? And since what I command is so important for the public good, what reason can you have to refuse this office?" The fathers replied, "That they feared the ridiculous superstitions which were added to the calendar might be attributed to them:" "This is what I do not desire," replied the emperor, "for I give no more credit to them than you; I require nothing of you but what regards the calendar, and what has relation to astronomy."

Then the fathers complied with the emperor's orders, at the same time making a public declaration, in which they not only protested that they had no hand in these fooleries, but that they absolutely condemned them, because human actions in no sense depend on the influences of the stars.

The calendar, of which I have been speaking, must be presented to the emperor for the year following on

the first day of the second month of the year; when the emperor has seen it, and given his approbation, the under-officers of the tribunal add to each day the superstitions before mentioned; afterwards, by the emperor's order, they are distributed to the princes, lords, and great officers, and sent to the viceroy of every province, who puts them into the hands of the treasurer-general of the same province; this latter causes them to be printed, and distributes them to all subordinate governors, and keeps the originals of the impression in his tribunal.

At the head of the calendar, printed in the form of a book in red, is the seal of the tribunal of astronomy, with the emperor's edict forbidding, under pain of death, to follow or print any other.

The distribution of the calendar is made every year with a great deal of ceremony; on this day all the Mandarines of Peking appear early in the morning at the palace; on the other hand the Mandarines of the tribunal of astronomy, in their proper habits, and with the ensigns of their offices, according to their degrees, resort to the usual place where their assemblies are held to accompany their calendars.

On a large gilded machine in the form of a pyramid, divided into four partitions one above another, are placed the calendars intended for the emperor, the empress, and the queens; they are in large paper covered with yellow satin, the emperor's colour, and handsomely inclosed in bags of cloth of gold; this machine is carried by forty footmen, cloathed in yellow.

Then they carry ten or twelve other machines of a smaller size, and surrounded with red curtains, upon which they place the calendars intended for the princes

of the blood; they are bound in red sattin, and are inclosed in cloth of silver.

Immediately after several tables follow covered with red carpets, on which are placed the calendars of the grandees, the generals of the army, and the other officers of the crown, all sealed with the signet of the tribunal of astronomy, and covered with a yellow cloth, and every table has the name of the Mandarin or tribunal to which the calendars belong.

The porters, who quit their loads at the last gate of the great hall, and place the tables on each side of the passage, leave nothing in the middle but the machine that carries the imperial calendar.

The Mandarines of the astronomical academy take the calendars of the emperor and the queens, and lay them upon two tables covered with yellow brocade, which stand at the entrance of the imperial hall; there they fall upon their knees, and prostrate themselves three times on the earth, and then deliver them to the intendants of the palace, who walk in order, according to their degrees, and present them to the emperor; afterwards the eunuchs carry them to the emperor and the queens.

Mean while the astronomical Mandarines return to the great hall, where the Mandarines of all degrees attend, to whom they distribute the rest of the calendars in the following manner.

First all the princes send their chief officer to the imperial passage, where they receive on their knees their master's calendars, and those of the Mandarines of their household, which amount at least to twelve or thirteen hundred calendars for the court of every prince.

Afterwards the lords, the generals of the army, the Mandarines of all the tribunals, appear and receive

on their knees a calendar from the astronomical Mandarines.

When the distribution is over every one returns to his rank in the hall, and turning himself towards the most inward part of the palace, at a signal given, falls upon his knees, and bows three times to the ground; after three genuflexions, and nine profound reverences with the head in acknowledgment of the favour done him by the emperor, he returns to his own house.

After the example of the court, the governors and Mandarines of the provinces receive the calendar in the same manner in the capital city, each according to his rank: As for the people there are none of them so poor but they will buy a calendar every year, and on this account they print in every province above thirty thousand a year.

In short it is a work so revered by the Chinese and their neighbours, and so important to the kingdom, that the receiving of the calendar is a declaration of being a subject, and tributary of the prince, and those that refuse it are looked upon as setting up a standard of rebellion.

A strong mark of the veneration that the people have for the calendar, and for their astronomy, is that Yang quang sien, the greatest enemy of the Christian name, in a book full of calumnies, which he published to decry the religion and astronomy of Europe, repeats almost in every page, "That it is unworthy of the
"majesty of the empire to subject their calendar to be
"reformed by European astronomers; for it is as tho'
" (said he), a vast and flourishing state should receive
" laws from a small foreign nation."

We have already taken notice that the Chinese astronomers divide the heavens into twenty eight constellations, in which they comprehend all the fixed

stars, as well those which are in the zodiac as those that lie near it; the following is a catalogue of the names of their constellations.

1. Kao.	11. Hio.	21. Tfan.
2. Kang.	12. Guey.	22. King.
3. Ti.	13. Che.	23. Quey.
4. Fang.	14. Pie.	24. Lieou.
5. Sin.	15. Juey.	25. Sing.
6. Vi.	16. Leou.	26. Chang.
7. Ki.	17. Guey.	27. Ye.
8. Teou.	18. Mao.	28. Chin.
9. Lieou.	19. Pie.	
10. Niou.	20. Tfury.	

It was the emperor Yu, of the family of Hia, who divided the heavens into the twenty eight constellations to distinguish the diverse mansions of the moon; for though the Chinese have distinguished, like us, the course of the sun into three hundred and sixty five degrees and fifteen minutes, of which we compose one year, they regard more the lunations than the course of the sun.

The spaces which they allow to their constellations are unequal as to the number of their degrees, but altogether form a circle of three hundred and sixty degrees: Upon these principles they make quadrants, whose style marks by its shadow the revolutions of the heavenly bodies, and the hour and part of the day or night in which each constellation passes the meridian of Peking.

Their manner of beginning the year, by the nearest new moon to the month of February, makes Pisces to be their first sign, Aries their second, and so of the rest; and because there are but twelve signs to make

the twelve solar months, and the lunations do not always quadrate with these signs, they have intercalary lunations to which they give the same sign as the precedent had, to recommence the order of the months according to the signs that are attributed to them; by this means they have months that follow the order of the signs, and others which have some days out of the signs.

This manner of calculation, and inserting the intercalary months, makes the year of thirteen months return from time to time: This gave occasion for the re-establishment of the missionaries in China, and put an end to the cruel persecution which they suffered by means of an Arabian astronomer and a Chinese Mandarin, who were enemies to the Christian religion.

As the astronomical tables of the Chinese were imperfect, and because after a certain number of years they were obliged to make corrections, otherwise there would be very enormous faults in the calendar published by the astronomers, they had recourse to the Europeans, but more especially to F. Ferdinando Verbieft: They were then loaded with nine chains, and closely guarded in the public prisons of the city. The late emperor Chang hi, who was then young, sent four great Mandarines to ask the missionaries if they knew of any fault in the Chinese calendar, as well of the present as of the succeeding year: These two calendars had been made according to the ancient Chinese astronomical tables.

F. Verbieft answered, That the calendars were full of faults, particularly in giving thirteen months to the following year: The Mandarines being informed of so gross an error, and of several other faults that had been observed, went immediately to give an account of them

to the emperor, who ordered the missionaries to attend at the palace the next morning.

At the hour appointed F. Buglio, F. Magalhaens, and F. Verbiest were conducted into the great hall of the palace, where all the Mandarines of the tribunal of astronomy expected them; in the presence of which assembly F. Verbiest discovered the errors of their calendar.

The young emperor, who had never seen them, sent for them into his apartment with all the astronomical Mandarines. F. Verbiest was placed directly over against him, when the emperor asked him very mildly, “If he could make it evidently appear, by experiments, whether the calendar agreed with the heavens or not?”

The father replied, “That it was a thing easily demonstrated, that the instruments in the observatory were made for that purpose, inasmuch that persons employed in affairs of state, and very little versed in astronomy, may in an instant judge of the calculations, and see if they agree with the heavens, or not. If your majesty desires it, replied the father, let there be placed in one of the courts a style, a chair, and a table of the size required, and I will immediately calculate the projection of the shadow at any hour proposed; by the length of the shadow it will be easy to determine the altitude of the sun, and from thence his place in the zodiac. By this method it will be no hard matter to judge whether its place is exactly calculated in the calendar for every day.”

The expedient pleased the emperor: He asked the Mandarines, “If they understood this manner of supputation, and whether they could predict the length of the shadow?” The Mahometan boldly replied,

“That he understood it; and that it was a sure method to distinguish the true from the false.”

Soon after the emperor commanded the Colao, and the Mandarines that were near him, to see every thing prepared; but while the orders were putting in execution the Mahometan thought proper to retract what he had said, and to confess his ignorance of that method of supputation.

The impudence of the astronomer greatly incensed the emperor, insomuch that he would have punished him on the spot, if he had not thought it more prudent to defer it till the trial was over, that his imposture might be discovered in the presence of his protectors: He therefore ordered the father to make his calculation alone that very day.

There was in the observatory at Peking a square column of brass eight foot three inches high, it was erected on a table of the same metal eighteen foot long, two broad, and an inch thick; this table, from the base of the column, was divided into seventeen foot, and each foot into ten parts, which they call inches, and these into ten parts, called minutes. The whole was surrounded near the edges with a small channel about half an inch broad, and of the same depth; this they filled with water that they might by that means place the table parallel to the horizon. This machine served formerly to determine the meridian shadows, but the column was pretty much bended by length of time, and did not stand at right angles with the table.

This style being measured and found to be eight foot, four inches, and nine minutes, the father fastened to the top of the column a smooth board parallel to the horizon, and precisely of the determined height, and by means of a perpendicular let fall from the plank

to the table he marked the point from whence he was to begin to reckon the length of the shadow. The sun was then near the winter solstice, and consequently the shadows were longer than at any other time of the year.

After making his calculation, according to the rules of trigonometry, he found that the shadow of the style ought to be the next day at noon sixteen foot, six minutes and a half: He drew a transverse line on the brass table to show that the shadow was to extend so far, and no farther: All the Mandarines met the next day at the observatory by order of the emperor, and at noon the shadow fell exactly upon the line that the father had traced on the table, at which they seemed greatly surprized.

The emperor took a great pleasure in the relation that was made of this experiment, and ordered the father to do the same again the next day in the great court of the palace. The Colaoes gave notice of it to F. Verbieft, and taking a brass ruler, which he had then in his hand, they determined two foot and eight inches for the length of the style.

At his return to his lodgings he made his calculations, after he had prepared a plank well plained, and another to serve for a style, the first was divided into feet and inches, and had three screws, by which it was easy to give it a horizontal situation; he went next day to the palace with this machine, and placed it in the great court, and adjusted it directly to the meridian, after he had marked with a right line on the horizontal plank the extremity of the shadow, which according to his calculation was to the four foot, three inches, four minutes and a half.

The Colaoes, and the rest of the Mandarines appointed to attend upon the observation, met in the same

place a little before noon, where they stood in a circle round about the style, and as the shadow seemed very long, because it did not as yet fall upon the plank, but on one side of the machine upon the ground, the Colaoes whispered and smiled on each other, verily believing that the father was deceived.

But a little before noon the shadow ascended the horizontal plank, and shortening itself all of a sudden at noon fell upon the line that was drawn precisely.

The Tartarian Mandarin discovered his surprize more than any of the rest, and cried out, What a skilful master have we here! the rest of the Mandarines did not speak a word, but from that moment began to conceive a jealousy of the father which has lasted ever since.

They acquainted the emperor with the success of the observation, and made him a present of a machine, which he received very graciously. It was invented by F. Magalhaens, who had made it in the night-time with great exactness.

The emperor not being willing to determine too hastily about an affair, which appeared to him of great consequence, put the father to a third trial, which was attended with like success.

The Mahometan astronomer, of whom I have spoken, had no other knowledge of the heavens than what he gathered from some old Arabian tables, which he had received from his ancestors. However he had been labouring a year at the reformation of the calendar, which was acknowledged to be very faulty.

He had made according to his manner, and presented to the emperor in two volumes, the calendar of the following year: the first volume contained the lunar months, days and hours of the new and full moons, and the quadratures, the time of the sun's entrance into

and coming to the middle of every sign, according to the Chinese method. In the second was the place of the planets for every day in the year, much after the manner of Argol's Ephemerides.

The emperor being persuaded, by the three observations of the shadow, that the calculations of F. Verbieft agreed with the heavens, ordered him to examine the two books of the Mahometan astronomer.

It was not difficult to find a great number of faults in this new calendar; for besides every thing being ill placed, and worse calculated, they abounded with evident contradictions; it was a mixture of the Chinese and the Arabian, infomuch that it might as well be called an Arabian as a Chinese calendar.

F. Verbieft made a small collection, wherein he mentioned the most gross errors in each month in the motion of the seven planets, and at the bottom wrote a petition, which was presented to the emperor. His majesty immediately convened a general assembly of the reguloes, Mandarines of the highest class, and the principal officers of all the orders, and of all the tribunals of the empire, and sent the father's petition that they might deliberate upon it, and come to proper resolutions. There never was seen so considerable an assembly, nor so solemnly convened on account of matters belonging to astronomy, infomuch that one would have imagined they had been called to consult the welfare and preservation of the empire.

They there read publickly F. Verbieft's petition, upon which the lords and principal members of the council unanimously declared, that the correction of the calendar being an important affair, and astronomy a difficult science, understood but by few, it was necessary to examine publickly, and by the instruments

of the observatory, the faults mentioned in the petition.

This decree of the council was confirmed by the emperor, who named, besides the Colaoes and the Mandarines, all the presidents of the chief tribunals to assist at the observations of the sun and the planets, which were to be made in the observatory.

The supreme tribunal of rites, to which that of astronomy is subordinate, sent for F. Verbiest and the Mahometan astronomer, and ordered them as soon as possible to regulate the observations they intended to make, and to put them in writing, with the manner of the performance.

The father had already calculated the places of the sun, moon, and the rest of the planets, determining the degrees and the minutes of the ecliptic where they were to be on certain days, wherein the Mahometan was most mistaken. These calculations were presented to the Mandarines of the tribunal, who determined that they should both come to the observatory, and with instruments in their hands sign and seal the degree and minute where they supposed each planet was to be.

The first observation was therefore made on the day the sun enters the fifteenth degree of Aquarius; a large quadrant, which the father had fixed on the meridian, shewed by its ruler the meridian altitude of the sun for that day, and the minute of the ecliptick that it was to be in at noon.

It was above six hours that the ruler had been put in that position, to which he affixed his seal. The hour being come, the sun passed through one of the sights, and fell as was expected on the other. A sextant of six foot radius, which he fixed six days before to the altitude of the æquator, showed the sun's de-

clination very exactly, infomuch that they could not find the least fault.

Fifteen days afterwards the father had the happiness to succeed in the same manner, observing with the same instruments the sun's entrance into the sign Pisces. This observation was necessary to determine the famous question, whether the intercalary month was to be taken out of the calendar or not? The meridian altitude of the sun and its declination that day plainly proved the affirmative.

For the place of the rest of the planets, as it was necessary to observe them in the night-time to refute what had been set down in the Mahometan's calendar, he thought he could not do it more plainly and sensibly than in determining their distances from the fixed stars. He had already calculated these distances, and in the presence of certain Mandarines he marked on a map of the zodiack the distance of these stars at the hour fixed by the emperor.

On the day that the experiment was to be made the court was divided in their opinions about what the father had promised; in the evening the Colaoes, the Mandarines, the mathematicians of the three tribunals, as well Chinese as Tartarian, flocked from all parts of the city, the latter with a great train of men on horseback, and the former in chairs carried on their servants shoulders.

Having clearly perceived that, of all the father had proposed to demonstrate, there was no failure in the least tittle, they acknowledged that the calendar calculated by the Mahometan was full of faults, and took care to inform the emperor of it.

The emperor referred the affair to the council, where the astronomers Yang quang sien and Uming huen,

contrary to custom, found means to be present, and by their artifices divided the votes of the assembly.

The Mandarines, at the head of the assembly, could not bear with patience that the Chinese astronomy should be abolished, and that of Europe introduced in its room: they maintained that the majesty of the empire would suffer if they altered any thing in this science, since hitherto all nations have derived their laws, politicks, and skill in government from them; and they affirmed it was better to adhere to the astronomy of their forefathers, though a little defective, than to introduce another which they were not accustomed to. They attributed to the two astronomers the glory of standing up for their country, and looked upon them as zealous defenders of the grandeur of their ancestors.

The principal Tartarian Mandarines were of a contrary opinion, and pleaded in behalf of F. Verbieft; the disputes were carried on, on both sides, with a great deal of warmth; at length Yang quang sien, depending upon the protection of the ministers of state who were his friends, addressing himself to the Tartars, spoke thus. “If you favour the opinion of Ferdinand, by receiving the astronomy that he would introduce, you may assure yourselves that the empire of the Tartars will not last long in China.”

So rash a discourse was received with indignation by the Tartarian Mandarines, who immediately informed the emperor of all that had passed. His majesty ordered that very instant that Yang quang sien should be loaded with irons, and shut up in the common prison.

At the same time F. Verbieft received orders to reform the calendar and the astronomy of the whole empire; he had also the superintendency of the tribunal of mathematicks, and they offered to dignify him with

several other titles, which he obstinately refused in four memorials which he presented to the emperor.

When F. Verbiest saw himself at the head of the astronomical tribunal he presented a memorial to the emperor, setting forth the necessity of retrenching a month from the current year, which was contrary to the course of the sun; and as the Chinese astronomers had left out the thirteenth month this year he made it appear that it was an unheard of mistake, and that even according to their own calculations the intercalary moon belonged to the following year, which memorial was referred to the privy council.

The members of the council looked upon it as a melancholy thing, that it should be necessary to lop a whole month from the calendar that had been so solemnly received, but they neither could nor durst contradict F. Verbiest; they thought it most proper to send the chief president of the council to make their remonstrances.

The Mandarin accosted the father in a very mild manner: "Take heed," says he to him, "what you are going to do, you are about to make us despicable among the neighbouring nations, who follow and respect the Chinese calendar, by letting them know that there has been so gross an error that it is necessary to take a whole month from the current year; cannot you dissemble this matter, or at least find out an expedient to save our reputation? If you can you will do us great service. The father replied, that it was not in his power to make the heavens agree with their calendar, and that there was an indispensable necessity of taking away a month."

Upon this they published an edict through the empire to this effect, That, according to the astronomical observations of F. Verbiest, it was necessary to take

away the intercalary month from the current year, therefore every person was forbid to use it for the future. They who were ignorant of astronomy were greatly surpris'd at this, and could not imagine what was become of this month that was ordered to be re-trenched, and wanted to be informed where it was kept in reserve.

The father having thus regulated the course of the stars, and fixed the Chinese year, he applied himself to re-establish whatever else was defective in the tribunal of the mathematics; his chief care was to furnish the observatory with new instruments proper for astronomical observations; he caused them to be made with the greatest exactness, but however admirable they appeared, the Chinese, who are great admirers of antiquity, would have preferred the old ones, had not the emperor, by an express order, prohibited the use of them.

These instruments are well cast, very large, adorned with figures of dragons, and well contrived for the uses to which they are designed: nothing of this sort would be comparable to them, if the niceness of the divisions were answerable to the rest of the work, and instead of plain sights telescopes had been used, according to the method of the royal academy.

F. le Compte, who examined these instruments very attentively, gives us the following exact description of them.

The first instrument is an armillary sphere of six feet in diameter, which is supported by four dragons' heads, whose bodies after several windings are fastned to the ends of two brazen beams laid across, that bear the whole weight of the machine. These dragons, which were picked out among all other creatures, because the emperor bears them in his coat of arms, are

as the Chinese represent them, wrapt up in clouds, with long hair on their heads between their horns, a fuzzy beard under their lower jaw, flaming eyes, long sharp teeth, their mouth open, and breathing a whole stream of flame. Four lions of the same metal stand under the end of the same beams, whose ends are raised higher or lower by screws fastned with them. The circles are divided both in their exterior and interior surface by cross lines into three hundred and sixty degrees each, and each degree into sixty minutes, and the latter into portions of ten seconds each by small pins.

The second instrument is an equinoctial sphere of six feet diameter, supported by a dragon, who bears it on his back bowed, and whose four claws seize the four ends of its pedestal, which as the former is formed of two brazen beams cross-wise, whose ends are also born by four small lions, which serve to set it right. The design is noble and well executed.

The third instrument is an azimuthal horizon, six feet in diameter, and is very useful for taking of azimuths; it is composed of a large circle horizontally placed, the double ruler which makes the diameter slides along the whole limb, according to the degrees of the horizon that are to be marked, and carries round along with it an upright triangle, the upper angle of which is fastened to a beam raised perpendicular from the centre of the said horizon. Four twisted dragons bow their heads under the inferior limb of the great circle, to make it fast; and two others wound round two small columns, mount on either side semi-circular-wise, as high as the said beam, to which they are fastened, to keep the triangle steady.

The fourth instrument is a large quadrant, whose radius is six feet, and the limb is divided into portions

of ten seconds each; the lead which shews its vertical situation, weighs a pound, and hangs from the center by a very fine brass wire; the ruler is moveable, and slides easily along the limb. A twisted dragon encompassed with clouds, seizes on all parts the several plates of the instrument to fasten them, lest they should start out of their due position. The whole body of the quadrant hangs in the air, and a fixed axis runs through its center, round which the quadrant turns towards the parts of the heavens which the mathematician chooses to observe; and lest its weight should cause it to shiver, and loose its vertical position, a beam is raised on each side, secured at the bottom by a dragon, and fixed to the middle beam or axis by clouds which seem to come out of the air. The whole work is solid and well contrived.

The fifth instrument is a sextant, whose radius is about eight feet; this is supported by a beam, the basis of which is concave, made fast with dragons, and crossed in the middle by a brazen pillar, on one end of which is an engine, the help of whose wheels serves to facilitate the motion of that instrument. On this engine rests the middle of a small brazen beam, which represents a radius of the sextant, and is fastened to it. Its upper part is terminated by a thick cylinder, which is the center, round which the ruler turns, and the lower is extended above two feet beyond the limb, that it may be grasped by the pulley which serves to raise it. These large and heavy machines serve rather for ornaments of the observatory, than for the use of the observers.

The sixth and last machine is a celestial globe of six feet diameter, and is in my opinion the fairest and best executed of them all. The globe itself is brazen, exactly round and smooth: the stars well made, and in

their true places, and all the circles of a proportionable breadth and thickness. It is besides so well hung, that the least touch moves it, and though it is above two thousand weight, the least child may elevate it to any degree. On its large concave basis rest in an opposite station four dragons, whose rugged hair sustains the horizon, which is very curious on account of the beauty of its workmanship and its variety of ornaments. The meridian in which the pole is fixed, rests upon clouds that issue out of the basis, and slides easily between them, its motion being facilitated by some hidden wheels, and moves with it the whole globe, to give it the required elevation. Besides which the horizon, dragons, and two brazen beams which lie cross in the center of the basis's concavity, are all moved at pleasure, without stirring the basis, which still remains fixed; this facilitates the due placing of the horizon, whether in respect of the natural horizon, or in respect of the globe. These machines being most of them above ten feet from the ground, are encompassed with marble steps in the form of an amphitheatre, for the greater conveniency of the astronomers.

VOL. II.

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Of the ARTS and MANUFACTURES of the CHINESE.

THE principal manufacture of China is that of silk, which employs a vast number of people, and is to that empire what the woollen manufacture is to Great Britain.

Italy in former times received the rich present of silk from Greece, which was worth its weight in gold, in the times of the Roman emperors; Greece was indebted to the Persians for it, and these, according to authors who have wrote with most sincerity, as M. de Herbelot remarks, own, that they originally got their silk-worms, and learnt the art of managing them, from China.

It would be difficult to find any accounts of so early a time as that wherein silk-worms were first found in China, and yet the discovery of them is imputed by the most ancient writers to Si ling, one of the wives of the emperor Hoang ti.

The people made use of the skins of animals till the reign of this queen; when the country was but newly cleared, and the inhabitants of the country multiplying greatly, and not finding skins sufficient, necessity made them industrious, so that they found out cloth to cover themselves withal, but they were obliged to this princess for the invention of the silk manufacture.

The empresses afterwards agreeably employed themselves in feeding and hatching silk-worms, in separating the silk, and putting it to a proper use: There was even an orchard for mulberry-trees set apart in the palace, where the empress, attended with the queens and ladies of the court, went to gather the leaves of three

branches with her own hands, which her servants brought within her reach; the fine pieces of silk that were made by her order, or which she made herself, were intended for the ceremony of the great sacrifice to Chang ti.

Policy it is thought rather than any thing else, gave rise to this practice, with an intention by such great examples to engage the princes, ladies of quality, and all the people in general to encourage silk-worms.

This custom has been for some time neglected; yet there is a particular district within the walls of the palace, full of houses, wherein the French church stands, the passage to which is still named The road that leads to the palace, set aside for silk-worms, for the amusement of the empress and the queens.

China may be called the country of silk, for it appears to be inexhaustible, furnishing several nations in Europe, and Asia; and the emperor, the princes, the domesticks, the men of letters, the Mandarines, and all in general that are in pretty good circumstances, wear garments of silk, and are cloathed with damask or sattin: none except the common people wear blue calicoes.

All the provinces of the empire furnish exceeding fine silks, yet that which comes from Tche kiang is the best. The Chinese esteem that silk to be best which is fine, white, and soft; for if it appears rough they conclude that it is bad. The silk is often not fit to be milled when it is brought into Europe, for they burn it by doing it over with a certain water made of rice and lime, to make it look well.

But there is nothing easier than to mill that which is good; a Chinese workman can mill this silk above an hour together without resting, that is without breaking

a thread, so that there can be nothing more beautiful or elegant.

They make use of mills very different from those in Europe; two or three wretched blades of bamboo, with a cog-wheel, are enough; it is amazing to see the simplicity of the instruments with which they make the finest silk.

There is another sort of silk at Canton which comes from Tong king, that is not so good as that which comes from Tche kiang, and they make the finest pieces in the province of Kiang nan of this silk, for the best workmen frequent this province, who furnish the emperor with silks for his own use, and to make presents; the great trade that they carry on at Canton, whither all strangers resort, likewise draws many of the best workmen thither.

As the Chinese prefer the useful to the agreeable, they confine themselves to the making of plain silks; but if they were certain of a market, they could make as rich silks as any in Europe.

They indeed make cloth of gold, but they do not make the gold into small wire, that they may mingle it with the thread, as is done in Europe, they are satisfied with gilding a long sheet of paper, which they cut into small pieces, and very ingeniously cover silken threads with it.

When the cloth first comes out of the workman's hands it is very elegant, but it does not last long, and is not fit for garments, because the lustre of the gold is soon tarnished with the damp air; but it does very well for making ornaments for churches, and for furniture. Nobody makes use of this cloth but Mandarines and their wives, and they not very often.

Besides the silks which have been already mentioned, the Chinese make use of fine flowered gauzes, of which

their summer habits are made, damasks of all kinds and colours, black fattins of Nanking, striped fattins, course taffeties that are very useful, and many other kinds, some flowered like gograms, others that are genteelly striped or marbled, or worked with little roses, &c. others the flowers of which are open like gauzes, crape, plush, brocade, and many kinds of velvet; the crimson colour is the dearest, but one may be easily deluded in it; by mixing the juice of limon with lime, and putting a few drops of it on different places, is the best way to find out the false; if it does not keep its colour, it is counterfeit.

Lastly, the Chinese have a great number of other silks, whose names are not known in Europe, but there are two sorts that are most frequently worn amongst them.

1. A kind of fatten not so glossy but stronger than the European, which is named 'Touan tse; there are some variegated with butterflies, flowers, birds, trees, &c. and some plain.

2. Their drawers and linings are made of a particular kind of lutestring, called 'Tcheou tse: it is close, and yet so pliant, that if it is folded and pressed with the hand it will not take the impression of the fold; it may be washed like linnen, without its gloss being much impaired.

The Chinese workmen give a gloss to the 'Tcheou tse or lutestring, with the fat of a river Porpus, which they call Kiang tchu, that is, Hog of the river Yang tse Kiang, for porpoises are seen in this great river, which is about sixty leagues from the sea; they are not so large as those in the salt water, but they leap and play like them, and follow one another in a line in companies through the fresh water.

They purify the fat by washing and boiling; then

they dip a fine brush in it, and rub the silk over from top to bottom always the same way, and only on the side they want to make glossy. The workmen burn the same melted fat in their lamps instead of oil, when they work at night: the smell of it keeps the flies from the place where they work, which is thought to be a great benefit, for these insects spoil the work by settling on it.

The province of Chan tong produces a particular kind of silk, which is found in large quantities in the fields, and on the trees; it is manufactured into a stuff called Kien tcheou. Small insects much like caterpillars make this silk; they spin it into long threads, and not into a round or oval cord, like the silk-worms; these threads as they are driven about by the wind, hang upon the bushes and trees, and are collected to make a kind of silk, which is not so fine as that made of the silk spun in houses, but these worms are wild, and eat either mulberry or any other leaves: people who do not know this silk, would imagine it to be either a coarse kind of drugget, or unbleached cloth.

There are two sorts of worms which spin this silk; the first, which are much larger and blacker than the common silk-worms, are called T Fouen kien; the second are called Tiao kien, and are not so large.

The silk of the first is of a reddish grey, that of the other is darkish: the stuff is between both colours that is made of these materials, it is very close, does not fret, and wears well, washes like linen, and when it is good it will take no damage by spots, even though oil were to be spilt on it.

The Chinese are very fond of this stuff, and it is sometimes as dear as the finest silks or sattin. As the Chinese are very skilful at imitating, with the waste of the Tche kiang silk, they make a false kind of Kien

teheou, which might easily be taken for the genuine, if not properly inspected.

A manufacture of stockings, ribbons, and silk buttons has been for some time set up at Canton, all which are made very good; the largest buttons may be bought for ten pence a dozen, and silk stockings for a tael.

Since the goodness and quantity of silk chiefly depends on the management of the worms that produce it, the method which they follow in China may become as useful as it is curious. A reputed author, who lived under the government of Ming, and who was of a province that abounds in silk, has wrote a pretty large volume on this subject, of which the following is an abridgment.

An ABRIDGMENT of an ancient CHINESE BOOK that teaches the MANAGEMENT of SILK-WORMS, so as the greatest quantity and best sort of silk may be obtained.

THE Chinese author begins with the cultivation of mulberry-trees, whose leaves nourish the silk-worms: because these insects, like other animals, unless they are properly fed, are not capable of working. He makes mention of two kinds of mulberry-trees, the true ones, which are named Sang, or Ti sang; but it must not be imagined that they bear as large mulberries as ours; the most useful part of them is their leaves, and they have no other intention in cultivating them, than to make a greater number of leaves shoot out.

There are others which grow wild, and are named Tche or Ye sang; these are small trees, whose fruit and leaves are not like those of the mulberry-tree; their leaves are little, rough, and round, ending in a point, and the edges are scolloped; the fruit of the Tche re-

seemles pepper, growing on the stem of every leaf, the thick and thorny branches grow in the shape of a bush; these trees make a kind of forest, and grow naturally upon the hills.

There are some silk-worms which are hatched in the house, and afterwards put upon these trees, where they make their cods, and are nourished; these worms are longer and larger than the house ones, and although their work is not worth so much, nevertheless it has its excellence, as may be seen from what I have mentioned of the stuff named Kieu tcheou: it is the silk that these worms produce, that the strings of the musical instruments are made of, because it is strong and resounding.

We must not imagine that these wild mulberry-trees or Tche demand no attendance, and that it is enough to load them with silk-worms, for there must be a good many paths made in these little woods in order to pluck up the weeds that grow below the trees. The weeds are prejudicious, because they are a shelter for insects, and especially serpents, who delight in destroying these large worms: the roads are likewise very proper, that the keepers may constantly go about the wood in the day-time with a gun or long pole, to drive away the birds that are enemies to these worms, and to sound a large copper basin at night to keep away the birds of night. This care must be always taken till the time of collecting the work.

It must be remarked, that those leaves must be taken off in the summer which the worms have not touched in the spring, as the leaves of the new spring would have very pernicious and poisonous qualities, if they were left on the tree. The circulation of the sap is clearly explained in a Chinese book of plants; it is imagined that the sap, circulating into the body of the

tree from the old leaves, hurts the whole mass by its rankness, which arises to the utmost parts of the branches from the root of the tree.

It is proper to cultivate the tree Tche, for the nourishment of the house-worms after the manner of the true mulberry-trees; but it is needful above all things to sow millet in the land where they are planted at a proper distance from each other; the millet corrects the harshness of the small leaves, which grow in greater plenty and thicker; the worms spin the earliest and make the strongest silk that live upon these leaves.

If the webs that hang upon trees in Europe were to be carefully observed, perhaps some such discovery might be made: they should be taken before the worms change into butterflies, for when they forsake their webs, they do not leave their eggs in them, the most part of which are ruined by several accidents. Many of these vigorous webs should be collected, in order to have butterflies of both sexes; the next year the eggs being hatched, the worms should be put upon the trees from whence they were taken, where they might be fed without any inconvenience: it is probable that it was in this way that the Chinese discovered the silk-worms.

A remark has been made, which the Chinese author takes no notice of, and which however may be of use, viz. That in place of the tree Tche, whose leaves feed the silk-worms that spin the silk fit for making the Kien tcheou, we may make use of oak leaves. The late emperor Cang hi made a trial of it; one year, that he spent the summer and autumn at Geho, in Tartary, he made some silk-worms be fed with oak leaves.

Perhaps, if they would run the risk of putting the house-silk-worms upon a young oak, some of them

would use themselves to this sort of life, as we see persons that have been brought up in a tender manner accustom themselves to the fatigues and food of a private soldier. Consequently their young ones would be a wild kind, like those that spin the silk which makes the Kien tcheou: at least a trial might be made if the house-silk-worms would like these first tender leaves of the oak, and if so, the want of mulberry-trees, which are very backward some years, might be supplied.

The mulberry-tree is the next thing which the Chinese author mentions, and we may reduce what he says to these following articles: which is the good or bad kind of the mulberry-trees; how they might be improved by the choice and cultivating of the soil, what art is necessary in collecting the leaves, in grafting the trees, and particularly in pruning them. Finally, what means must be taken to increase the good kind.

Those mulberry-trees which shoot forth fruit before the leaves, are worth nothing, their leaves for the most part being very unwholesome and small, and besides, that kind does not last long, and declines in a short time.

In the choice of young plants, those that have an uneven rind must be refused, because their leaves will be small and thin: on the contrary, those that have a smooth and white rind must be chosen: large leaves will spring out of them, and in great quantities, and the worms that feed thereon will bring forth in the season cods which are close and full of silk.

Those mulberry-trees that produce the least fruit are the best, because the juice is not so much separated. There is a method to make them bear little fruit, and plenty of leaves; to do this, they give their hens mulberries fresh collected or dried in the sun, after which the dung of these fowls is collected, and steeped in wa-

ter, then some mulberry-feed is soaked in this water, after which it is sown.

The good mulberry-trees are divided into two sorts, which are named from the province from whence they first came. Some are named King sang; King is the name of a country in the province of Hou quang, their leaves are thin and a little pointed, and shaped like gourd leaves, but not so large; the heart of the trunk is solid, and the root is lasting; the worms produce a strong silk that live upon these leaves, and is very fit for making the Cha or the Lo cha (which is a kind of thick gauze or crape. Worms newly hatched are above all things fond of the leaves of the King, for every age has a particular food such as is the most pleasing to it.

The mulberry-trees of Lou, an ancient name of the province of Chan tong, produce but few mulberries: their trunks grow tall, their leaves are strong, large, thick, round, and full of juice; the branches are lively, and found, but the root and the heart are unsound, and do not last; though the leaves are always good, yet when they are pretty well grown, they are most proper to feed the worms with.

Among these sorts of mulberry-trees there are some whose leaves sprout out very early; these must be placed near the house, that the roots may be kept free of weeds, which must be watered and dunged in a dry season, that provender may be at hand for these valuable insects.

When they strip the young trees of too many leaves before they are three years old, they feel afterwards the effects of it, they become feeble and backward: it is so with those whose branches and leaves are not cut off smooth, which they lop after the leaves are quite stripped off: they are in the greatest perfection when they are three years old, but when they are five their

• roots twist one within another, and they begin to decline. The cure for this is to open them about the spring, and cut the roots that are too much twisted, and then spread them over with earth prepared for that purpose, which easily binds through the care which they take to water it.

There is a method of reviving them when they grow old, viz. by lopping off all the decayed branches, and ingrafting sound shoots, whereby there is a juice conveyed through the whole body of the tree which animates it. The beginning of the second moon, which answers to our March, is the time you must graft them.

• To hinder these trees from growing weak, you must often examine whether certain worms have not made way into them, to deposit their seed; they destroy these worms, by infusing a little oil of the fruit of the Tong-tree: the same effect would undoubtedly be produced by any other strong oil.

The ground fit for mulberry trees should neither be hard nor stiff: a piece of land, which has not been cultivated for some time, and has lately been broke up, is the properest for that use.

In the provinces of Tche kiang and Kiang nan, from whence the best silk comes, the soil is manured with mud, which they get out of the canals, that separate the country, and are cleaned every year; ashes and the dung of animals and silk-worms are made use of for this purpose. The little pulse which they sow between the trees does no harm to them, provided they take care not to plough up the earth near a tree, for the share would be prejudicial to the roots.

But the chief and most useful thing is, to mind that the mulberry-trees be cut at a proper time, and by an able hand; this makes the leaves sprout out the sooner, and in greater plenty: these leaves are better now.

ished, and of a taste proper to encourage the appetite of the worms. You must not be afraid to thin the branches, and particularly those in the middle of the tree, in order to leave a free and empty space, and then the collector of the leaves being placed in the middle of the tree, stands much more convenient to reach them, and will collect more leaves in one day than another would do in several, who had not taken this precaution, which saves a good deal of cost.

Besides, the worms do not run the risque of being hurt thereby; when they are hungry, their food is much sooner prepared than if it was collected from a mulberry-tree as thick as a bush: they make use of a ladder made with a prop, for the more easy collecting of the leaves all about the tree, whereby it is supported without resting upon the mulberry-tree, for fear of doing harm to it. Our author says that a mulberry-tree well pruned, is worth and yields twice as much as two others that are not.

The time for pruning mulberry-trees is the month of January; they do it in the same manner as vines are done; it is enough that the branches which they leave have four knots, the surplus must be rejected: four parts of the branches are entirely cut off, viz. 1st, Those which lean towards the root. 2d, Those which sprout inwards, and stretch towards the trunk. 3d, Those that are forked, which come out two and two from the trunk of the tree, must be cut off. Lastly, they cut off those that are too thick and full of leaves, but in other respects grow very well.

Those branches which sprout outwards only must be left; they will look very fresh and lively the next spring, and those leaves which are earliest will hasten the growth of the worm, and augment the profit of the silk.

Our author lays great stress upon the art of pruning the mulberry trees, and very freely says, that the people of the province of Chan tong, who do not follow these rules, should make a trial of this way, and not remain stubborn in their old method.

Mulberry trees should be collected towards the end of autumn, before they grow yellow; they must be dried in the sun, then beaten small, and preserved in a place that does not smoke, where they must be put into great earthen vessels, whose mouths must be stopped with clay. In the spring these broken leaves will be reduced to a kind of flour, which is given to the worms after they have cast their slough. I shall explain in proper order the good effect it causes, and the manner of giving it.

They take great care in the province of Kiang nan and Tche kiang, not to let the mulberry-trees grow too tall; they prune them that they may not grow above a certain height: the toppings which they carefully collect are of use, for the Chinese can make a profit of every thing. 1st, In places where wood is not plenty, they use them for fuel to heat the water, in which they put the the cods of silk, that they may be the more easily separated. 2^d, They make a lye of the ashes of these branches, into which they throw the cods which the butterflies have bored, and all others that are bad. With the assistance of the lye, in which they stew, they swell very much, and become proper to be spun for pack-thread, or to be prepared for wad, which serves instead of cotton. 3^d, Some take the bark of these branches before they are burnt, of which they make a kind of paper, which is strong enough to cover common umbrellas, especially when it is coloured and oiled.

Care must be taken to renew the mulberry-trees when

they grow old, and their leaves become rank; besides the method of renewing them by grafts, as I have before explained, they obtain new plants either by putting many of the sound and fresh branches through little barrels made of two pieces of a great bamboo, which they fill with a good earth: or by bending some of the long branches down in the spring which they left in pruning time, and putting the end into earth prepared for that purpose; these branches will have taken root the December following; then they cut them neatly from the body of the tree, and transplant them in the season.

They also sow the seed of the mulberry-tree, which must be got from the fruit that grows on the midst of the branches of the best trees. The ashes of the branches which they burn must be mixed with the seed; the next day they stir it together in water; the seed that is not good swims on the top when the water is settled; that must be dried in the sun which sinks to the bottom, after which they sow it with an equal portion of millet. The millet is of great use to the mulberry-tree, by protecting it from the heat of the sun, for it stands in need of a shade at first. When the millet is ripe, they wait for a high wind, and then set it on fire: the mulberry-trees sprout out with a good deal of more vigour the following spring.

They cut off the top of the plants when they are grown to a proper height, in order to make branches spring out on the sides, but they cut off all the side branches till the tree is grown to a proper height, then these mulberry-trees must be transplanted into several lines about eight or ten paces distant from each other. They do not set the trees of one line facing those of another; perhaps they imitate this irregularity that the trees should not hide each other.

It is not enough to have managed the mulberry-trees

so that they afford a suitable food for the silk-worms, there must also be a proper habitation made for these valuable insects, which must be adapted to their different conditions, and the time when they are engaged at work. These skilful labourers, who contribute their substance to the delicacy and luxury of our furniture and garments, are worthy of being respectfully treated. The riches which they produce depends chiefly on the care which is taken of them; if they pine or suffer the work will accordingly grow less.

Some Chinese authors have treated of a proper dwelling-place for the silk-worms, but they have wrote only for those who follow an old settled manner, in regard to a small quantity of silk compared to their capacities and leisure, for almost every house raises silk-worms in some provinces. The author here cited, and who came to be one of the first ministers of the empire, has completely handled the matter, and has only wrote for the great laboratories in which they are at a great expence, but are at last repaid with great interest.

Our author says, that a proper place must be chosen for the habitation of the silk-worms, it must be near a rivulet, upon a dry and rising ground, for as it is proper that the eggs should be often washed, running water is the properest for that purpose. It must be a retired place where this habitation is built, free from unwholesome smells, cattle, and all noises: a noisome smell, or the least fright, have a great affect upon so tender a breed; even cocks crowing, or dogs barking are enough to put them into confusion, when they are first hatched.

Build a square chamber, which may be put to other uses when the silk-worms are out of season; as it is proper that the chamber should be warm, you must take care that the walls be well built; the entrance

must never be towards the north, but to face the south or south east; there may be four windows, one on every side the chamber, to let in air as there may be occasion for it: These windows, which are not often open, are made of a white and clear paper, because there are some hours in which the light is proper, and others when it is not, therefore they make use of umbrellas over the sashes for that purpose.

They also make use of these umbrellas to keep the place from pernicious winds, such as the south and south-west winds, which should never be permitted to enter; and as a cooling zephyr is sometimes wanted, it is proper to open one of these windows, but if it is in a time when the air is full of gnats, it will certainly destroy the worms; they make blemishes on the cods of silk if they fall upon them, which makes them very difficult to wind; the best method, and that which is most used to prevent this, is to hasten the work before the gnats come. They keep good cats to guard the entrance of the chamber against the little lizards and rats, which would devour the silk-worms.

It is of great importance, as shall be made appear hereafter, that the eggs be hatched all at the same time, and that the worms eat, sleep, wake, and cast their slough together, and for this end the chamber must be kept always of an equal and constant heat. The manner our author proposes is to build four little stoves, to keep fires in the four corners of the room, or else to have a good portable fire-pan, which must be moved about the chamber, and taken away when it is thought proper; but this fire-pan must be lighted out of the chamber, and buried under a heap of ashes, for a blue or red flame would do harm to the worms.

Our author also requires that the fuel should be cowdung which warms the chamber; he advises to collect

it in the winter, to soften it in water, and to make it into bricks, to be dried in the sun. These bricks must be put upon pieces of hard wood, with which the bottom of the stoves are covered; this fuel being lighted, causes a gentle warmth, which is very necessary for the worms, they being also fond of the smell of the dung; but great care must be taken not to let any smoke be in the chamber, for the worms cannot endure it; this fire lasts a good while under the ashes, which is a great advantage. Finally, it is proper that the outside of the door be covered with a double matt, to keep out the coldness of the air, and to defend the place from any damp, otherwise there is little gain to be expected.

The next thing is to supply this place with the utensils proper for the support of the silk-worms: Nine or ten stories of shelves must be made at the distance of nine inches from each other; a kind of net-work made of rushes is put upon these, the holes of which are large enough to admit the little finger, that the warmth of the place may penetrate them the more readily, and that they may the sooner grow cold; these several stories must be erected in such a manner as to leave a free passage round, and a clear space in the middle: The worms are hatched upon these rushes, and nourished here till they are fit to spin, but then the scene alters.

In short, these rushes being the cradle as it were of these very tender insects, they put a kind of bed upon them, that is to say, they cover them over with a lay of straw cut small, upon which they put a long sheet of paper that has been made soft with gentle handling; when the sheet has been made dirty with their dung, or with the remnants of their meals (for they never eat the fibres of the leaves) they spread a net over it,

having meshes which yield a free passage; they put mulberry-leaves upon this net, the smell of which instantly entices the hungry worms, then they take the net off carefully, and place it upon a new bed, whilst they make the old one clean, that it may serve again.

These are the cautions to be taken for the silk-worms' habitation. Our author also adds, that there should be a thick hedge, or a wall, about the chamber, pretty near it, particularly on the west side, that the setting sun may not shine upon the silk-worms when they are obliged to let in the air on that part.

He advises you to make use of a bag-net, which opens and shuts like a purse, when you collect the mulberry-leaves, that they may not be shut too close, and that they may not wither and their moisture be dried up in carrying them.

As the worms should have a more nice and prepared food when first hatched, he says that the leaves must be cut into small thin threads, and that for this use a very sharp knife must be used, which may not crush the leaves in cutting them, and which may leave all the agreeable taste.

We often find that plants degenerate, and that the original is better than the seed; it is much the same with the butterflies, there are some languishing and feeble, a good brood is not to be expected from these, it is therefore proper to choose them; this choice is made at two particular times.

First, The time to discern the males from the females is before they go out of their cods; the mark they distinguish them by is this, the cods that contain the male butterflies are a little pointed, fine and close, and not so large as the others; the cods that contain the females are rounder, larger, and thicker, and not

so neat: Those cods are best that are for the most part clear, and a little transparent, clean and solid.

Second, The safest way to make this choice is after the butterflies are come out, which is after they have been retired fourteen days; you must not choose those to multiply the species which come out a day before the others, but those which come out the next day in great numbers, and the latest must also be refused. This is another mark in which you cannot err; the butterflies that have bald eye-brows, bended wings, a reddish body, and a dry tail, and not hairy, must not be taken to increase the breed.

When this choice is made, they bring the males and females together, which they put upon several sheets of paper, that they may couple. This paper must be made of the bark of the mulberry-tree, and not of hemp; they must be strengthened with silk or cotton threads made fast on the back side, because they must be three times dipped in water when they are covered with eggs, which is proper to preserve them: These sheets of paper must be extended upon mats covered with straw; after the butterflies have been together about twelve hours, the males must be taken away; if they were to be together any longer, the eggs which they would bring forth being later, could not be hatched with the others, which disadvantage should always be shunned: The male butterflies must not be put into the same place with those which were refused in the beginning.

It is proper to give the females room, and cover them, that they may lay their eggs more advantageously, for darkness prevents them from dispersing their eggs: They must be kept covered four or five days after they have done laying, after which all these butterflies, with those which were set aside, or which were

taken dead out of the shells, must be buried deep in earth, for if any beast or fowl should eat any, it would kill them: Some say that no brambles, or any other prickly plant would grow in the places of that field in which they were buried for many years: Others put them into fish-ponds, and they say there is nothing better to fatten the fish.

As to the precious seed that continues sticking upon the sheets of paper, some of it must still be thrown away; for example, those eggs which sticking together make a kind of clods; we must expect silk from the others, and great care must be taken of these: Upon which my author is surprized, that the worms being so sensible of the least coldness or moistness of the air, their eggs are quite the reverse, they being the better for snow and water: Would not one imagine, says he, that their natures are not the same? He compares the alterations which the worms go through, which successively become ants, caterpillars, and then butterflies, to the alterations which happen in order to plants by the spreading of their parts, which in one situation are solid, and in another grow wider, some of which decay and drop off as soon as others appear in their full strength.

The first thing which must be observed is to hang up these sheets covered with eggs on the beam of the chamber, which in the front must be open, so that the air may come in, without the sun shining on them; that side of the sheet must not be turned outwards on which the eggs are laid; the fire must neither smoke nor blaze which warms the room; you must also be careful that no hempen ropes be near either the eggs or worms. These cautions are not recited without reason. They roll up the sheets loosely, so that the eggs be within the sheet, after they have been hanging

for some days, and then they are hanged up again in the same way during the summer and autumn.

The end of December, or in January, which is the eighth of the twelfth moon, when there is an intercalary month, they put the eggs into cold river water, if they can get any, or in water in which a little salt has been dissolved, being cautious that this water does not freeze; the sheets are left there two days, and they keep them down to the bottom of the vessel, by putting a china dish over them, lest they should swim. After having taken them out of the water, they hang them up again, and roll them a little tighter, when they are dry, and close them singly, standing on one end in an earthen vessel; after that, in about ten days, when the sun shines very clear, they lay the sheet open to its rays in a place that is sheltered where there is no dew; they suffer them to be exposed to the sun about half an hour, and then roll them up in the same manner as before.

There are some who do not use this custom; they put the sheets mixed with the ashes of the mulberry branches into water, and after they have been in a day or two they take them out to sink them a short time in snow-water, or else hang them three nights on a mulberry-tree, to receive the snow or rain, if it be not too severe.

These baths procure a silk easy to be wound, and help to make it thicker, stronger, and not so porous, whether made of a kind of lye and snow-water, or of river-water, or water mixed with salt: Their chief use is to preserve their internal heat, in which their prolific virtue consists.

When the young leaves begin to sprout out of the mulberry-trees, it is time to think of hatching the eggs, for they hasten or keep them back according to the dif-

ferent qualities of cold or heat which they give them; they hasten them if they often lay the sheets open to the sun, and if in shutting them up they roll them up loosely; by doing the contrary they keep them back.

As it is proper that the worms should all be hatched at the same time, this should be done the three last days before they are hatched; the eggs swell, and grow a little pointed, when they are ready to come out; the first three days about ten or eleven o'clock, when the sky is serene, and there is a little wind, as there commonly is at this season, these valuable rolls of paper are taken out of the vessel, opened to the whole length, and hung up so that the sun may shine on the back of the sheets, which continue in the sun till they get a moderate heat; then they are wrapt up tight, and put endways into the vessel in a warm place till the next day, when they are again taken out, and treated as they were the first day.

The eggs will be perceived to change to an ash colour the second day; then they put two sheets together, and roll them up very tight, tying the ends; they open the sheets towards the end of the third day, and stretch them on a fine mat, and the eggs then seem blackish; if there are any worms hatched they must be thrown away, as they would never be like the others; for practice informs us, that the worms which are first hatched never are like the others in the time of casting their sloughs, of eating, working, nor what is most material, of making their silk; these irregular worms would very much increase their care and trouble, and occasion a loss by this disorder, wherefore they are dispersed betimes; they being thus separated, they roll three sheets very loosely together, and carry them to a

very warm place, that is protected from the south wind.

They take out the rolls about ten or eleven o'clock the next day, and upon opening them find them full of worms resembling black ants, and are named He y; the eggs must be forsaken that are not hatched an hour afterwards; all the young worms must be thrown away that have a flat head, or that are shrivelled, and appear as if they were scorched, or that are of a sky-blue, flesh, or yellow colour; the good kind are of a colour resembling a mountain at a distance.

The first thing to be done is to weigh the sheet which contains the worms newly hatched, afterwards holding this sheet sloping and turned almost upside down upon a long sheet of paper strewed with mulberry-leaves, and prepared in the forementioned manner, the smell of these leaves will attract the young famished worms, but those which are the most sluggish must be helped down with a hen's feather, or by striking gently the back of the sheet; immediately after they weigh the sheet by itself to know exactly the weight of the worms, by which they regulate the quantity of leaves that is necessary for the nourishment of these worms, and also the weight of the cods which they shall produce, if no accident befalls them.

The present concern is to make these worms observe a good regimen, and to give their lodging a convenient heat; for this purpose they provide an affectionate mother for the worms, who is careful to let them never be in want; our author calls her T'san mou, mother of the worms.

She takes possession of the chamber, but not till she has washed herself, and put on clean clothes, which have no bad smell; she must not have eaten any thing immediately before, or have handled any wild succory,

the smell of which is very hurtful to these tender creatures; she must be cloathed in a plain habit, without any lining, that she may the more sensibly feel the warmth of the place, and accordingly increase or lessen the fire, but she must be very cautious of not making a smoke or raising a dust, which would be very offensive to the tender nature of these insects, which must be carefully humoured before the first time of casting their slough. Every day is a year to them, says our author, and has in a manner the four seasons, in morning, mid-day, evening, and night.

The following general practical rules, founded upon experience, must be observed. 1. The eggs must be kept very cold all the time they are preserved before they are hatched. 2. They require a great heat when they are hatched, and are like ants. 3. A moderate heat is required when they are grown caterpillars, and towards the time of their casting their slough. 4. They must be kept cool after the great moulting. 5. They must be heated by degrees when they are upon the decline, and growing old. 6. When they spin, they require a great heat.

The delicacy of these little insects requires that great care should be taken to keep every thing out of the way which might incommode them, for they have their distastes and antipathies; they more especially dislike hemp, leaves that are moist or heated by the sun, dust raised by sweeping when they are newly hatched, the moisture of the earth, flies and gnats, the smell of broiled fish and burnt hair, musk, smoak, the breath which smells of wine, ginger, lettuce, wild succory, all great noises, fluttery, the rays of the sun, the light of a lamp, whose quivering flame must not shine in their eyes during the night-time, the wind which comes through the crevices and chinks of the

chamber, a great wind, cold, heat, and especially a sudden change from very cold to very hot weather: These insects are very much hurt by all these things.

The principal cause of their diseases is the feeding of them with leaves covered with dew, those which have been dried in the sun or in a high wind, or those which have received any ill taint: The leaves should be gathered two or three days beforehand, and kept in an open, clean, and airy place, remembering to give them at first the tenderest leaves cut into very little threads.

Three or four days after, when they begin to turn white, their food must be increased in quantity, and not be cut so small; they afterwards become blackish, when they must have a greater quantity of leaves, and as they are gathered from the tree. When they become white again, and eat with less appetite, do not give them so much at a meal; afterwards they turn a little yellow, and then they must have a lesser quantity of food; then they become quite yellow, and are, according to the Chinese language, at the *eve of one of the three sleeps*, that is to say, they are ready to cast their slough, then give them nothing; every time they cast their slough they must be thus managed, according to their bigness.

The following account is more exact than the former; These worms eat the same in the night as in the day; the day after they are hatched they must be fed forty eight different times, twice every hour; the second day thirty, but the leaves must not be cut so small; the third day they must have still less; these little insects are then like new-born children, who would always be at the breast, and pine without it; if their food was not proportioned to their appetites they would be overheated, which would destroy the

most promising hopes: Some think it best to give at first leaves which some healthy persons have kept for some time in their bosoms, the perspiration of a human body agreeing very well with these young worms.

At their meal-times their food must be spread every where alike; cloudy and rainy weather take away their stomach, you must therefore immediately before their repast light a wisp of dry straw, which must be all of a light, then hold it over the worms to deliver them from the cold and moisture which benumbs them; this small help sharpens their appetites, and prevents diseases; a strong light contributes likewise to this, therefore they pull up the umbrellas of the windows in the day time.

The reason of their being so careful to make these insects eat so often is, because it forwards their growth, and causes them to spin the sooner; upon this care depends the great profit which they expect from these creatures. If they come to their full growth in twenty three or twenty five days, a hurdle covered with worms, whose weight at first was a Mas, that is, not much more than a dram, will produce twenty five ounces of silk; whereas, if for want of proper care and nourishment they do not come to their perfection in less than twenty eight days, they will produce no more than twenty ounces, and if they are a month or forty days in growing they will have but ten ounces.

Feed them frequently when they begin to grow old, and do not give them too much at a time, in the same manner as they are used when young; if they did not digest their food in the time when they begin to spin, the cods would be wet and soaked with a salt water, which would render the silk very difficult to be wound; in short, when they have been hatched twenty four or

twenty five days, the longer they are before they spin the more leaves they consume, the less silk they produce, and the mulberry trees, by reason of being too much stript of their leaves before the season, will bud later the year following.

You must give them often little leaves, after they have cast their slough, and but few at a time; this is like a second birth, or, according to other authors, a sort of recovery. When the worms, says he, are just upon casting their slough, they resemble a sick man when some great change is expected, and death seems to be approaching, but if he can sleep a night, he becomes quite another man, and nothing remains but to recover his former strength by a moderate diet.

But there are other diseases which must be prevented or cured, and which are occasioned either by cold or too much heat; to prevent the diseases occasioned by cold, a just heat must be kept in the chamber where they are; if notwithstanding these precautions the cold has seized these little labourers, either for want of the windows being shut down close, or because the mulberry leaves were not well dried, it destroys their appetite and causes a sort of flux, for instead of hard excrements they void a watery slime, and then you must burn cows' dung near those that are out of order, but without making any smoke; the smell of this burnt dung revives them more than one can imagine.

The disorders which proceed from too much heat are occasioned either by not giving them their food in a proper time, or by the quality and quantity of their food, or by an improper situation, or by the air becoming suddenly very hot: In this last case they open one or more of the windows, but never on the side from which the wind blows, for it must not come in a direct line into the chamber, but by a circuit, that it

may be qualified; for instance, if it is a south wind they open the window towards the north; and if the wind is too hot, they set a vessel full of cold water before the door or window, that it may be cooled in its passage; they likewise sprinkle the chamber with cold water, and you must be very cautious in doing this that not the smallest drop fall upon the worms.

When a too great internal heat causes their disorders, they are cured by giving them a kind of meal made of mulberry leaves, gathered in autumn, and reduced to a very fine powder, as before shewn. They moisten the leaves designed for this repast, and strew under them this meal, which sticks to them, but they diminish the quantity of leaves according to the meal which they add; for instance, if they mix four ounces of meal, they reduce four ounces of leaves: There are some who say that the meal of certain little green pease, which are eaten for a cooling diet, may serve instead of the leaf-powder; it certainly refreshes those worms that eat it readily, and makes them grow stronger.

Heats are frequently occasioned by their being crowded together, which make the worms sick, and this distemper is the most common and the most dangerous; they must not be confined but whilst they are in the egg, for they require a great deal of room as soon as they are hatched, especially when they are grown caterpillars, because they abound in moisture. These insects are greatly hurt when they are not kept clean, altho' they are very nasty in themselves; they soon make a vast quantity of filth, which is not long in fermenting, and heats them considerably, if they are not carefully freed from it, either by sweeping it off with a feather, or, which is better, by carrying them frequently from one hurdle to another.

After they are pretty much grown, and are going

to cast their slough, they require these changings more than before, but then several persons must be employed, that the worms may be all removed at the same time; they must be handled very gently, and not let fall, nor be set down roughly, which would make them grow weaker, and more lazy in their work; the changing of the hurdle is alone sufficient to cure their disorders. To give a speedy relief to the sick, throw some dry rushes or cut straw upon them, and strew some mulberry leaves over this: They rise to eat, and by that means get out of their ordure, which heats them.

The success of these removals depends upon their being frequently repeated, taking an equal care of all the worms, and on doing it gently, giving them more room every time. When they are a little grown, the worms on one hurdle must be put upon three fresh ones, then on six, and so increasing to the number of twenty and upwards. These insects being full of humours must be kept at a proper distance from each other.

But the greatest caution is necessary when they are removed, that it be at the right instant of time; an apartment must be prepared for their work when they are of a shining yellow, and ready to spin: My author proposes a kind of rough frame of joiners' work, or a long roof, the sides of which must be almost upright, and the inside hollow; this must be divided all round into several partitions, to each of which there must be a ledge where the silk-worms are to be placed, and where they will range themselves in order; this machine must be hollow, that a man may conveniently go in without displacing any thing, to keep up a small fire, which defends the worms from moisture and cold, which are very hurtful at this time; I said a small fire, because

there must be just sufficient to procure a gentle warmth, which makes the worms more active in their work, and the silk more transparent. This large army of worms, being thus ranged in their apartment, must be surrounded with mats at a little distance, which must also cover the top of the machine to keep off the cold air, and because the worms love to work privately and in the dark.

Nevertheless after the third day of the work the mats are taken away from one o'clock to three, and they give the sun a free entrance into the chamber, but in such a manner that the rays may not shine upon these little labourers; after this time they are covered as before. When it happens to thunder, they must be preserved from the ill effects of the noise, and the lightning, by covering them with the sheets of paper which were used when they were upon the hurdles.

In seven days time the work of the cods is finished, and the worms quit their silken lodging in about seven more, and appear on their coming out in the shape of butterflies; when these cods are gathered it is a common way to put them in heaps, it being impossible to wind off all the silk immediately, because the time is taken up with other employments; yet there are some inconveniences in this method, for if there is any delay made in chusing out of the heap of cods those that are designed to increase the species, the butterflies having been squeezed and heated in the heap would not be so proper for this purpose; the females especially that had received any hurt would lay none but sickly eggs, therefore the cods designed for the multiplication of the species must be set apart, and laid loose upon a hurdle in a cool airy place.

As to the vast number of the other cods, which must be preserved from being bored by the butterflies, you

must contrive how to kill them without hurting the work; they must be put by little and little into the kettle, as they are wound off, for if they were to soak too long it would do harm to the filk; it would be best to wind them off all together, if a sufficient number of hands could be employed; my author affirms, that five men can wind off thirty pounds of cods, and supply two others with as much filk as they can make into skains, that is about ten pounds; but as that cannot always be done, the following methods may be used to preserve the cods from being bored.

The first method is to let them lie in the sun a whole day; this certainly kills the butterflies, but the heat of the sun is prejudicial to the filk.

The second is to put them *in balneo mariae*: Some reckon it useful to throw an ounce of salt, and half an ounce of oil of turnips into the copper, imagining that the exhalations impregnated with the acid spirits of the salt, and the sulphureous particles of the oil, make the cods better, and the filk more easy to divide; therefore the machine where the cods are must go entirely into the copper, the top of which must be covered and luted so that no steam may get out: But if this bath is not rightly ordered, in which several are mistaken, a great number of the butterflies will bore their cods; it must therefore be observed, 1. That the strong and hard cods have generally the outside of their filk coarser, and of course more easy to be divided, and for the same reason may be left longer *in balneo mariae*; the contrary must be observed of those that are thin and small. 2. That when the butterflies are killed *in balneo mariae* the cods must be spread upon mats, and when they are a little cooled they must be covered with small branches of willow or mulberry trees.

The third way of killing the butterflies, preferable

to the two former, is as follows: Put the cods into large earthen vessels, and in all these vessels throw four ounces of salt over every ten pounds of the cods, and cover them with large dry leaves like those of *Nephris*; lay ten pounds more of cods upon these leaves, sprinkled with four ounces of salt as before, filling the vessel with several lays; then closing the mouth of it, so that the air may be entirely excluded, the butterflies will be killed in seven days, but if the least air is admitted, by any chink, they will live long enough to pierce their cods; as they are of a porous substance, that readily imbibes the air, the least quantity getting in would keep them alive.

When you lay these cods in the vessels, the finest must be separated from the coarser; the cods that are long, white, and shining, give a very fine silk; those that are large, dark, and bluish, like the inner skin of an onion, produce a coarser silk.

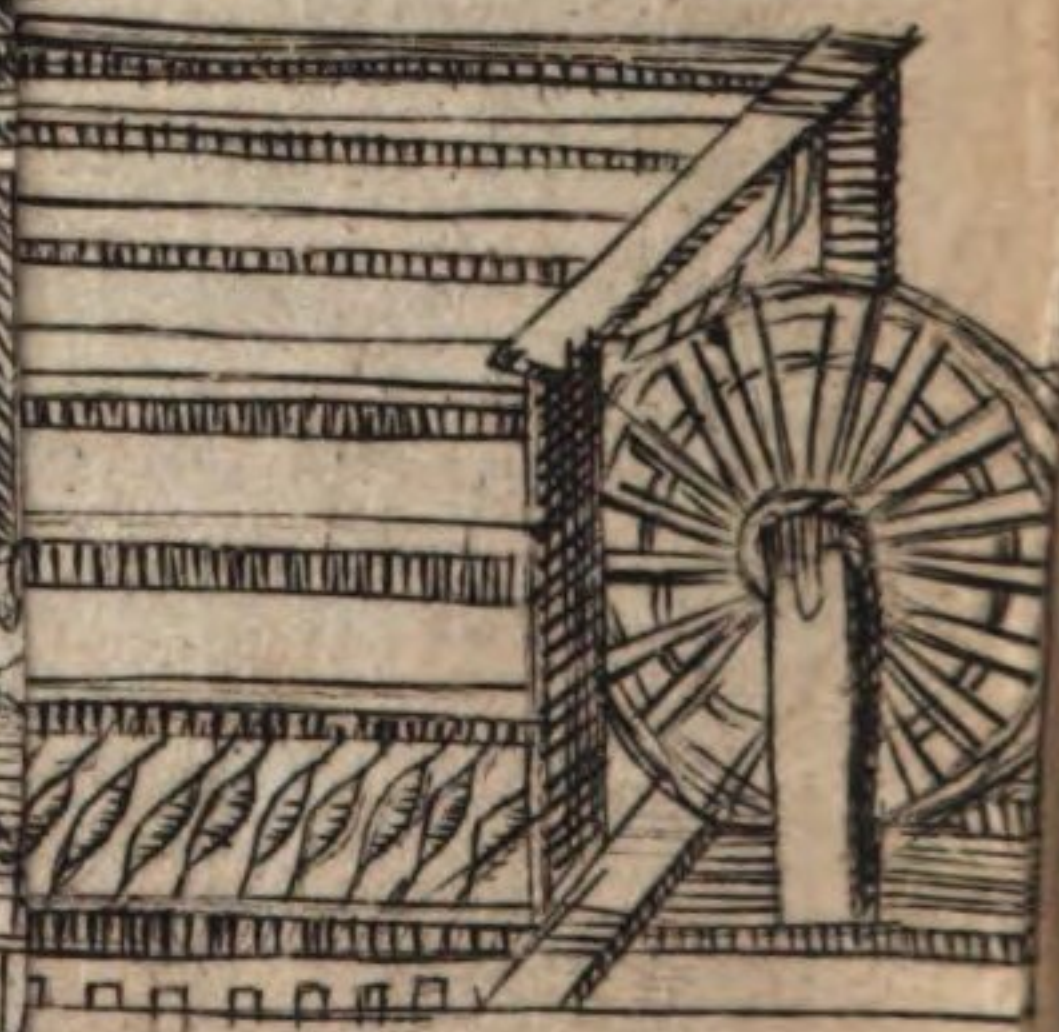
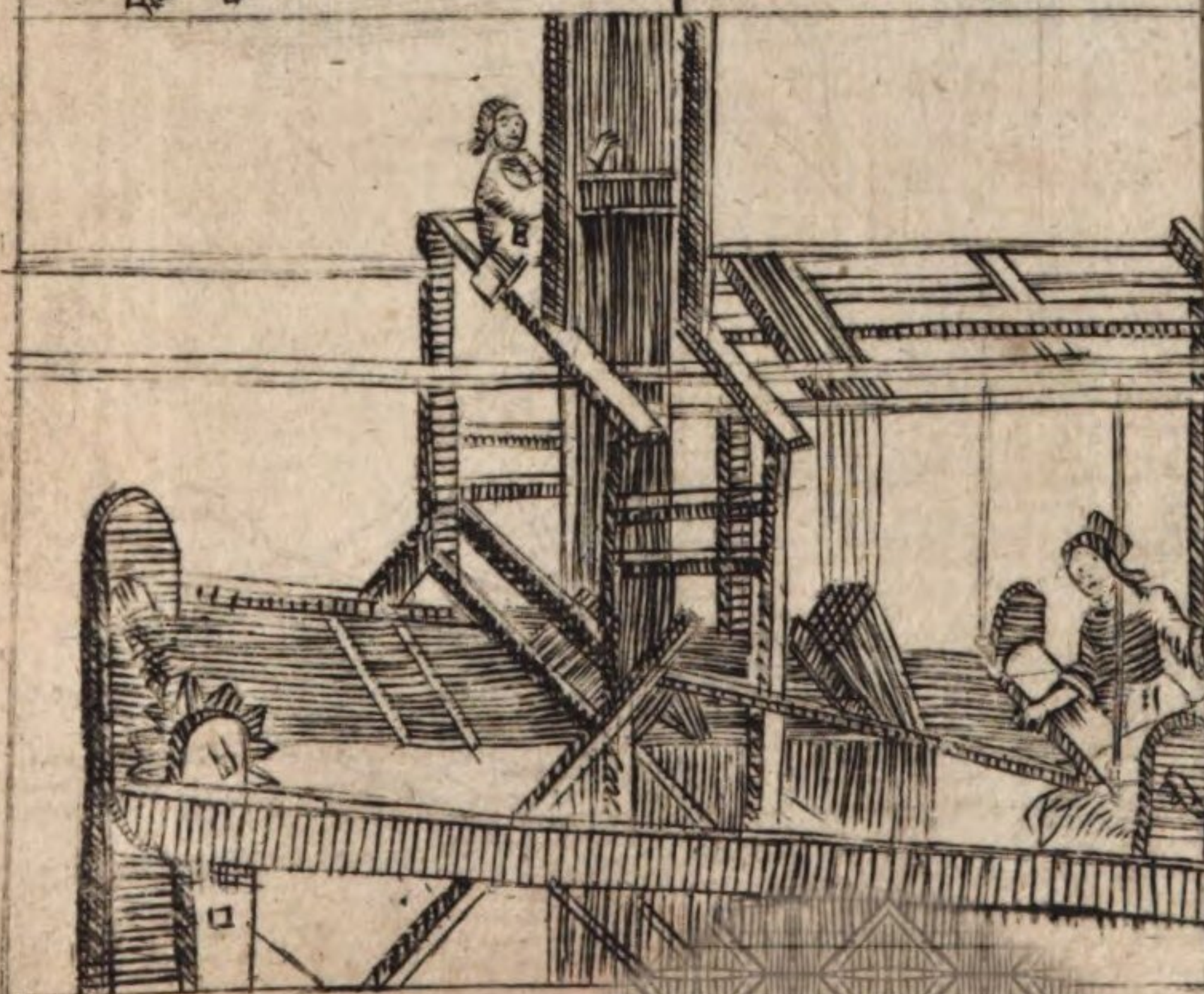
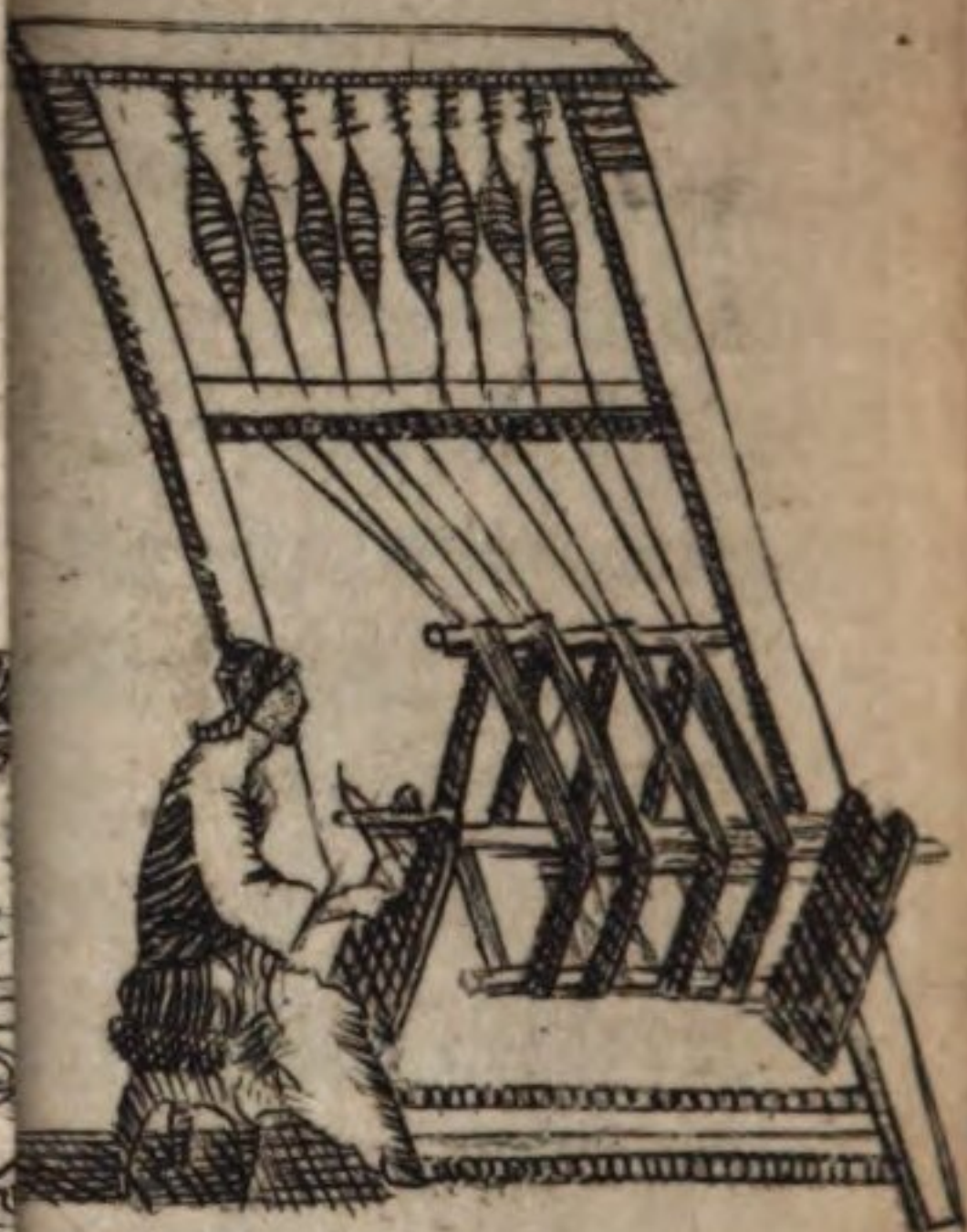
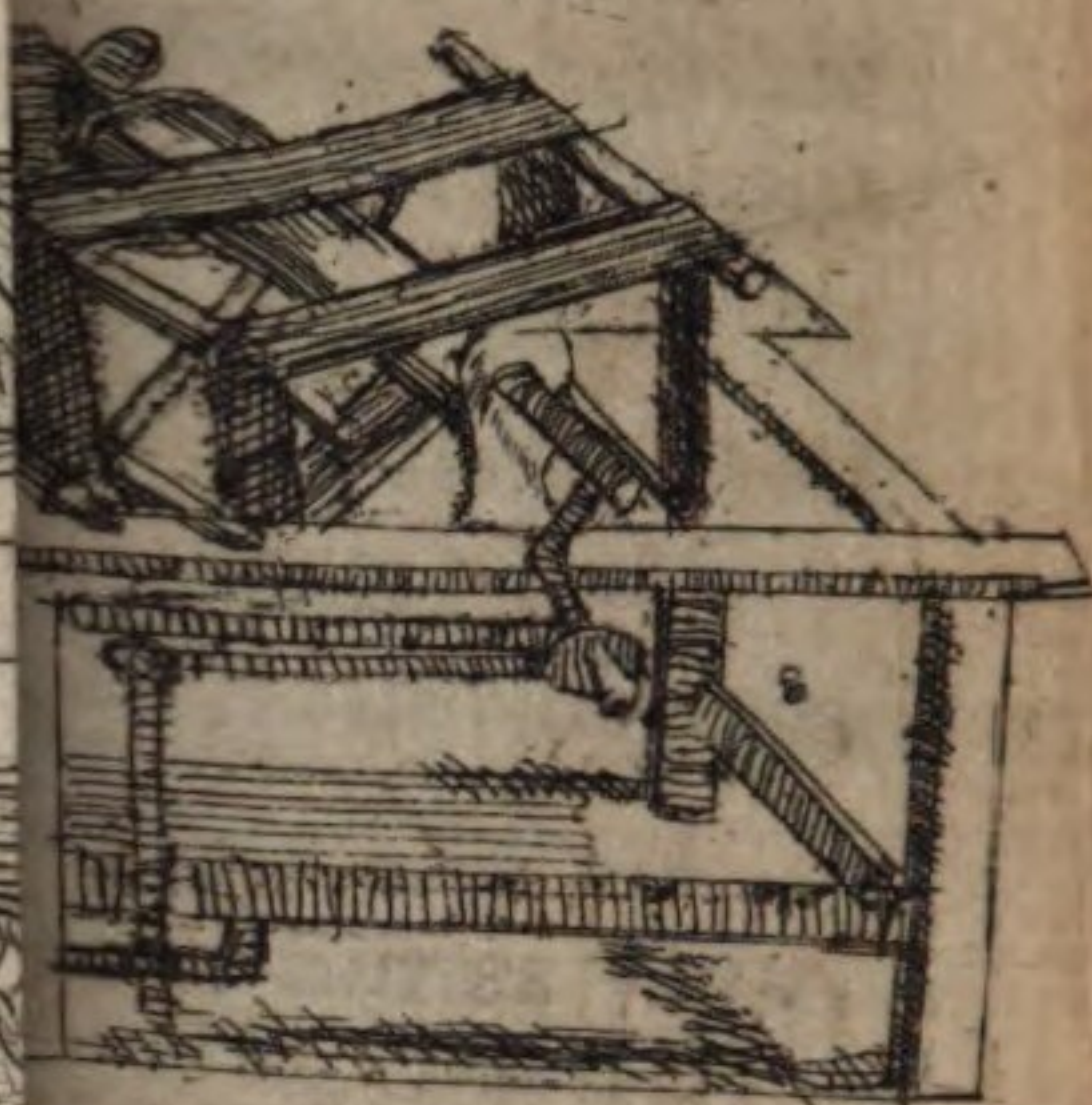
Hitherto I have treated only of the method of raising worms in the spring, and indeed it is in this season that the generality of the Chinese are employed in this work; nevertheless some hatch eggs in the summer and autumn, and almost in all the months after the first produce of the spring; but for this purpose they must provide workmen who are able to sustain such a continual labour, and mulberry trees to supply necessary food through all the seasons; but the mulberry trees would hardly suffice, for if they are quite stripped one year they die and fail entirely the following spring.

The best way, says my author, is to hatch but few worms in summer, and only to provide eggs for autumn: He likewise cites an author who advises to raise worms in that season, which commences about the fifteenth of August, but he would have only taken for

their food the leaves of those branches that may be spared without injuring the tree. The following are his reasons why autumn is preferable to the spring for raising worms: 1. Because the spring being for the most part rainy and windy in the southern countries, the profit expected from the labour of these worms is more uncertain; whereas in autumn, the weather being generally serene, there is a greater certainty of success. 2. That although the worms cannot have such tender leaves for food as in the spring, yet this is fully compensated by having nothing to fear from gnats and musketoes, the sting of which kills the worms.

When you raise any silk-worms in summer they must be kept cool, and the windows covered with gauze, to keep out the gnats. If any are raised in autumn, they must be kept cool at first, but after they have cast their slough, and when they spin, they must be kept warmer than in the spring, the nights being colder; when these autumnal worms become butterflies, they may lay eggs for the next year, yet it is esteemed the surest way to make a provision in the spring, because those of autumn do not always answer.

When any of the summer eggs are preserved to be hatched in autumn, they must be put into an earthen vessel well covered, so that nothing may get into it; put this vessel into a large basin of cold spring-water as high as the eggs inclosed, for if the water was higher it would perish the eggs, and if it was lower many would not have strength to hatch with the rest; if they should happen to hatch later they would either die or make a bad sort of cods; the eggs will hatch in twenty one days, if you strictly observe these directions. Some think it does as well, and hatches them as soon, to set them in the shade under some tree that is very thick



of branches, inclosed in a vessel made of earth without baking.

When the silk-worms begin to spin they may be placed in such a manner that, instead of making cods as they naturally do when left to themselves, they shall make a piece of silk flat, thin and round, like a large wafer. This is done by laying the worms, when they spin, on the top of a cup exactly covered with paper.

Many advantages would accrue from a work thus carried on.

1. You may divide these round and flat pieces as easily as the cods.

2. They are all pure silk, having none of that viscid matter which the worm emits in the shell upon being long inclosed in it, and which the Chinese call urine, for the work is taken away as soon as it has done spinning, otherwise it would spoil the silk.

3. You need not be in a hurry in dividing the silk, which is quite the reverse way of doing it when in cods.

As soon as the silk is wound off they prepare it for the loom. The tools which the Chinese make use of for this work are very simple; but as these matters are better explained by draughts, than by the exactest description, you have here a view of the several machines employed to compleat those elegant and valuable silks which the Europeans get from the Chinese.

Although wool is very plentiful in China, especially in the provinces of Shenfi and Shanfi, which abound with sheep, yet they make very little cloth; our English cloth is very much esteemed amongst them, and sells dearer than the richest silks. They make blankets of their own wool, and a sort of russet cloth, of which their students have gowns for the winter.

The Chinese likewise manufacture a great deal of

cotton, and make a kind of linen of a plant called Co, found only in the province of Fokien. It is a sort of creeping shrub, (probably a species of cotton) whose leaves are round, smooth, and green within, but whitish and downy on the outside. Some of the stems grow as thick as one's finger, which are pliable, and downy like the leaves. When it is gathered, bundles of it are put into water, as we do hemp; and, the outer skin being peeled off and thrown away, they divide the inner, which is much more fine and delicate, into very slender filaments, which are manufactured into a sort of linen, remarkable for its lightness and coolness; and accordingly the people of fashion wear vests of it in summer.

The number of books in China is immense, as they have known the noble art of printing for many centuries, whereas it has been discovered in Europe but of late years; but it is very different from that in use amongst us.

Our alphabet consisting but of a few letters, which by different combinations can make the largest volumes, there is no need of casting a great number of characters, since those which were used for the first may be used again for the second and following sheets: but the number of the Chinese characters being almost infinite, it is impossible to cast so prodigious a number, and if they were made, the greatest part would be of very little use.

Their manner of printing is thus: They get their work transcribed by a good writer upon a fine, thin, and transparent paper; the engraver pastes every sheet upon a plate of apple or pear-tree wood, or of any other, if it is but hard and smooth, and with a graver follows the traces, and carves out the characters by cutting down the rest of the wood; so he makes as

many different plates as there are pages to print, working off as many copies as are required, and at any time more may be worked off without composing anew; there is not much time lost in correcting the proofs, since as the engraver works from the copy, or the original of the author, he cannot possibly make any errors, if there be none in the copy itself.

This manner of printing is convenient, because they print the sheets as they sell them, and do not run the risque of selling but half the copies. Moreover, after having thrown off thirty or forty thousand copies, they can easily retouch the plates, and make them serve for several more impressions.

The Chinese is not the only language they print, they likewise do books in all sorts of languages: The beauty of the character depends upon the hand of the copyist; the skill of the engraver is so great, that the copy which is printed cannot easily be distinguished from the written one, so that the impression is good or bad according to the ability of the writer employed; this must be understood of our European characters, which are engraved and printed by the Chinese; as for the Chinese characters, which are engraved, the engraver frequently corrects the defects of the writer.

Our European manner of printing is nevertheless not unknown in China; they have moveable characters like ours, the only difference is that ours are of metal, and theirs of wood. It is with these that they amend every quarter of a year the state of China, which is printed at Peking: I have heard that at Nanking and Sou-tcheou they print in this manner some little books, as neatly and as well as those which are engraved by the best hands. This is credible, because it only requires a little more pains and care.

In urgent affairs, as when an order comes from

court, which contains many articles, and which must be printed in one night, they have another method of engraving: They cover a plate with yellow wax, and trace out the characters very quickly.

They do not use a press, as we do; the plates which are made of wood, and the paper which has not been dipped in allum, would not bear it; but when once the plates are engraved, the paper cut, and the ink in readiness, one man with his brush, and without fatiguing himself, may print every day near ten thousand sheets.

The plate they are using must be set level and firm; they have two brushes, one harder than the other, which are to be held in the hand, and which may be used at both ends of the handles; they dip one a little in the ink, and rub the plate with it, but so that it may not be too much nor too little moistened; if it was too much the letters would be blotched; if too little the characters would not print. When the plate is once in order they can print three or four sheets without dipping the brush in the ink.

The other brush must pass gently over the paper, pressing it down a little that it may take up the ink; this is easily done, because not being dipped in allum it presently imbibes it. You must pass the brush over the sheet more or fewer times, and press upon it according as there is more or less ink upon the plate: This brush must be oblong and soft.

Their printing ink is a liquid, and is much more ready than that which is sold in sticks. It is made of lampblack well beaten, and exposed to the sun, and then sifted through a sieve; the finer it is the better; it must be tempered with *aqua vitæ* till it come to the consistence of size, or of a thick paste; care must be taken that the lampblack may not clod.

After this it must be mixed with water till it comes to a proper consistence, neither too thick nor too thin. Lastly, to hinder it from sticking to the fingers they add a small quantity of glue, much of the same kind as that made use of by the joiners, melting it over the fire, and pouring on every ten ounces of ink about an ounce of glue, which they mix well with the lampblack and *aqua vitæ* before they are tempered with the water.

They print on no more than one side, because their paper is thin and transparent, and would not bear a double impression without confounding the characters; hence it is that every leaf of the book is folded, the fold being at the edge of the book, and the opening at the back, where they are sown together; so that their books are cut at the back, whereas ours are cut at the edges.

They do not gild upon the edges, nor so much as colour them. The ordinary books are covered with a grey pasteboard, handsome enough. They bind the better sort in a fine sattin, or a kind of flowered taffety, that is very cheap, and is commonly made on purpose for this use. Some they cover with rich silk, flowered with gold and silver; the form is always the same, but they are at cost, according to the matter they are willing to employ.

The Chinese neither write with pens like the Europeans, nor with canes or reeds like the Arabians, nor with a crayon like the Siamese, but with a pencil made of the hair of some animal, especially of rabbits, which is the softest.

In writing they do not hold the pencil obliquely as painters do, but perpendicularly; they write from the top to the bottom, and begin like the Hebrews from the right to the left, so that the end of our book is the beginning of theirs.

The materials of the Chinese paper, and the way of preparing them, being different from those in Europe, it is necessary to give an account of this amongst other curious manufactures of this country. The Chinese paper, it must be observed, is of divers kinds; some made of the rinds or barks of trees abounding in sap, as the mulberry tree and elm, but chiefly of the bamboo and cotton tree. In reality, almost every province has its several paper; that of Sechwen is made of hemp, that of Chekiang of wheat or rice straw, that of Kyangnan of the skin found in the balls of silk-worms, that of Fokien of soft bamboo, and the bark of the mulberry tree furnishes the paper used in the northern provinces.

As to paper made of the bark of trees, the manner of their preparation may be exemplified by that of the bamboo, a tree of the cane, or reed kind, but much larger, smoother, harder, and stronger than any other species. The second coat, or skin of the bark, which is white and soft, is commonly what is used for paper. This they beat in fair water to a pulp, which they take up in very large moulds or frames, so that they have sheets ten or twelve feet long, and sometimes more. They are compleated by dipping them sheet by sheet in alum-water, which serves instead of the size we make use of, and not only hinders the paper from imbibing the ink, but gives it a lustre that makes it look as if it were silvered, or at least varnished over. This sort of paper is white, soft, close, and without the least roughness; though, being made of the bark of a tree, it cracks sooner than European paper. Add to this, that it is more apt to take moisture, that the dust sticks to it, and that it is more liable to worms; to prevent which last inconveniency, the Chinese often beat their books, and expose them to the sun. Its thinness like-

wife makes it not so durable, so that they are under a frequent necessity of renewing their books by fresh impressions.

The paper of the bamboo, however, is not the best that is made in China, that of the cotton-shrub being the whitest and finest, and least subject to the inconveniences above mentioned. But the paper most commonly used in China is made of the tree called chuku or kuchu, which Du Halde compares first to a mulberry tree, then to a fig tree, then to a sycamore, &c. so that from his description we know as little of it as if he had said nothing about it. The greenish outside of this tree being first scraped away, the inner rind is taken off in long thin slips, which are blanched in water exposed to the sun, and then prepared and made into paper in the same manner as the bamboo.

Here it is to be observed that the bamboo and the cotton-shrub have this peculiarity, that not only their inner bark, but their whole substance may be employed, being prepared in the following manner: Out of a wood of the largest bamboos they select shoots of a year's growth, which are as thick as the calf of a man's leg; and these, being stripped of their outside rind, are split into straight pieces six or seven feet long, and steeped in a pond of muddy water, till they grow soft and rot by the maceration. They are then taken out, washed in clean water, spread in a large dry ditch, and there covered with lime for a few days. After this they are washed a second time, then separated in filaments, which are exposed to the sun to dry and whiten, then thrown into large coppers, where they are thoroughly boiled, and afterwards reduced to a thin paste or pulp by the strokes of weighty hammers. With this pulp they mix an unctuous kind of juice, extracted from the shoots of a plant called koteng, care being

taken not to put in too much or too little, on which the goodness of the paper very much depends. Having beaten this mixture well together, till it resembles a thick clammy water, they pour it into a large reservoir, with low walls round it, and so cemented on the sides and at bottom, as not to be penetrated by the liquor. This being done, the workmen standing at the sides of the reservoir dip in their moulds, and take up the surface of the liquor, which instantly becomes paper, the mucilaginous juice of the koteng binding the parts, and rendering it compact, soft, and glossy. To make sheets of an extraordinary size, they have large moulds sustained by strings, and lowered and raised by pulleys, some of the workmen being employed to let down and pull up the frame, and others to take off the sheets, each doing his office with great regularity and expedition.—In order to harden the sheets, and make them bear ink, they undergo the following operation called fanning, from the Chinese word fan, which signifies alum. Six ounces of fish-glue being cut small and steeped in water, it is afterwards boiled and stirred all the time to prevent lumps; and, the whole being reduced to a thin liquid substance, they melt and incorporate it with three quarters of a pound of calcined alum. Then this mixture is put into a wide basin, and, each sheet being drawn nimbly through it by means of a stick they use for that purpose, the paper is hung up to dry; for which end they have a hollow wall, whose sides are well whitened, through which it receives the heat of a neighbouring furnace; and by the help of this sort of stove the sheets are dried in a very little time.

This account of the Chinese paper leads us to describe their ink, which is an admirable composition, in vain attempted to be imitated in Europe. The Chi-

Chinese or Indian ink (as we commonly call it) is not fluid as ours is, but solid, like our mineral colours, though much lighter. It is made of lamp-black of several kinds, but the best is that obtained by burning hog's-grease; and with the black they mix a sort of oil to make it the smoother, adding some odorous ingredients to take away the rankness of the smell. When it is mixed into a paste of a proper consistence, they form it in moulds into little oblong sticks or cakes, about a quarter of an inch thick, and adorned with the figures of dragons, birds, flowers, &c. which are curiously cut in the wooden mould. To use this ink they have a piece of polished marble, made hollow so as to contain a little water, in which the stick of ink is rubbed till the water becomes of a sufficient blackness. Thus they presently have a fine ink, exceeding black, and of such a nature that it never runs or spreads farther than the pencil, so that the letters are always smooth and evenly terminated. It is of great use in designing, because the colour may be weakened or heightened at pleasure.

The Chinese have a pretty method of silvering paper (if we may call it so) at a small expence, and without using any silver. In order to this they take two scruples of a size or glue made of leather, one of alum, and half a pint of clean water. These they simmer over a gentle fire till the water is consumed, that is, till no more steam arises; and with a pencil they spread two or three layers of this glue over the sheets of paper laid smooth upon a table. Then through a fine sieve they sift over the paper a powder made of talc and alum, which having been boiled in water is dried in the sun and pounded; and this being spread uniformly on the sheets, they hang them in the shade to dry; after which they are laid again on the table, and

rubbed gently with clean cotton, to take off the superfluous powder, which serves a second time for the same purpose.

The manufacture of porcelane or China ware was a long time a mystery in Europe, in spite of all the endeavours of the Jesuit missionaries to penetrate into the secret. The veil however was at length removed by father d'Entrecolles, who, in a letter from China to father Orry in the year 1712, (which was published in French) describes the whole process in all its circumstances; an extract whereof cannot fail of being agreeable to the curious reader. Two kinds of earth are used in the composition of porcelane, the one called kaulin, full of glittering particles, and the other petunse, which is of a plain white, dug out of the mines in the shape of bricks, and much harder than the former. This last sort of earth is first broken and pounded into a coarse powder with iron hammers, wrought either by the hand or by mills; and when by repeating the operation, the powder is rendered almost impalpable, they throw it into a large urn full of water, stirring it briskly about with an iron instrument. Then letting the water rest a while, they skim from the top a white substance formed there, of the thickness of four or five fingers, putting this scum or cream into another vessel of water. They then stir the water of the first vessel a second time, and when it has settled they skim it again; and so alternately, till nothing remains at the bottom but the gravel of the petunses, which are committed to the mill for another grinding. As to the second urn, wherein the skimmings of the first were put, when the water is well settled and become quite clear, they pour it off, and fill a kind of moulds with the sediment collected at the bottom, which, when almost dry, they take out and cut into

square pieces. The preparation of the kaulin is the same, only this being softer will dissolve in the water without pounding.

A third ingredient in the composition of porcelane is an oil or varnish drawn from the hard petunses, which for this purpose undergo the same preparation as for making the squares, except that the sediment of the second vessel is not put into moulds, but the finest part of it used to compose the oil (as they call it) which is a whitish liquid matter. With this matter they mix a powder made of calcined mineral stone called shekau, resembling our alum, which gives the oil a good consistence, but not so as to destroy its fluidity.

The oil of lime makes a fourth ingredient, the preparation whereof is more tedious than the former. They first sprinkle water on quick lime, and thereby reduce it to a powder, on which they lay a bed of dry fern, and on the fern another of flaked lime, and thus alternately till they have a pile of a moderate height; which done, they set fire to the fern, and, the whole being consumed, they sprinkle the ashes on new beds of fern, setting them on fire as before. This they repeat five or six times successively, or even more; the oil being the better, the oftener the ashes are burnt. A quantity of these ashes are now put into a vessel of water, and to every hundred weight of ashes is added a pound of shekau, which dissolves in the water. This mixture is well stirred together, then stands to settle, and, after a farther preparation in another vessel, the sediment at the bottom, which is to be kept liquid, is what they call the oil of lime, esteeming it the soul of the former oil, and that which gives the porcelane all its lustre.—Ten measures of the petunse oil are usually mixed with one of lime; and, to have the

mixture just, the two oils should be of an equal thickness.

It is almost inconceivable what a number of persons are employed in this manufacture, there being scarce a piece of porcelane that does not pass through more than sixty hands before it is brought to perfection. The places they work in are vast inclosed yards, built round with sheds and other conveniencies, as well as lodgings for the workmen. In mixing the two earths regard is had to the fineness of the ware intended to be made, equal quantities of petunse and kaulin being used for the finest porcelanes, and one part of kaulin to three of petunse for the coarsest. The hardest part of the work is the kneading and incorporating the two earths together, which is done in large basons or pits well paved and cemented, wherein the workmen trample it continually with their feet, relieving one another till the mass be well mixed, grows hard, and is fit for the potter. After the earth is taken out of the pits, it is kneaded by piece-meal with the hands on large slates; and on this operation the goodness of the work very much depends, the least heterogeneous body, remaining in the mass, or the least vacuity, being enough to spoil the whole. The smallest grain of sand, nay, sometimes a single hair, will make the porcelane crack, warp, or splinter.

Smooth pieces of porcelane, such as cups, saucers, dishes, &c. are fashioned with the wheel, like our earthen ware; but those which are adorned with figures of animals, &c. in relievo are formed in moulds, and finished with the chissel. Indeed all the porcelanes made in moulds are finished by the hand, with several instruments proper to dig, smooth, polish, and touch up the strokes that escape the mould; so that it is rather a work of sculpture than of pottery. On some

vessels they add relievos ready made, as dragons, flowers, &c. and others have ornaments engraven with a kind of puncheons. The moulds are made of a yellow earth, well kneaded and beaten, and are sold very dear, but they last a long time.

It is to be observed, that large vessels of porcelane are made at twice, one half of the piece being raised on the wheel by three or four workmen, who hold it till it has acquired its figure; and, the other half being formed in the same manner, they join them together with porcelane earth dissolved in water, polishing the juncture with a kind of iron spatula. By the same means they join together several pieces of porcelane formed in moulds or by the hand; and also add handles, &c. to cups or other vessels fashioned by the wheel.

The many hands which a common tea-cup passes through before it be fit for the painter may give us an idea of the number employed in other branches of this curious manufacture. The cup is begun by the potter, who has the management of the wheel, from whence it acquires its form, height, and diameter; but it comes out of his hands very imperfect, especially towards the foot, which is only an unformed lump of earth, to be cut with a chissel when the cup is dry. From the wheel the cup is received by a second workman, who forms its base; and a third takes it immediately from him, and applies it to a mould on a kind of lathe, to give it its true shape. A fourth workman polishes the cup with a chissel, especially about the edge, and brings it to such a thinness as is necessary to make it transparent; in doing which he moistens it from time to time, to prevent its breaking. After this another turns it gently on a mould to smooth its inside, taking great care that it be done equally, lest it should warp, or any cavity be formed.

Some workmen add relievos, others adorn the vessels with the graver or puncheon, others add handles, &c. each keeping to his particular employment. Even the reounding and hollowing the foot of a cup on the inside with a chissel is the business of an artist who meddles with no other part. And this multiplicity of hands is so far from retarding the work, that it is found by experience to be carried on the faster for it, as well as to be better performed; each workman, by a continual attention to the same thing, being more perfect and ready at it, than if he were frequently shifting from one operation to another.

The painting is none of the least beauties of the porcelane, but it would be a considerable addition to it if the designs were more just and regular. The flowers and landships indeed are sometimes tolerable, and their borders prettily variegated; but their human figures are monstrous, and look as if they were fond of deviating from nature. This business is divided among a great many workmen in the same laboratory: One is employed in forming the coloured circle about the edges of the porcelane; a second traces out flowers, which another paints; this is for landships only, that for birds and other animals, and a third for human figures. As to the colours of porcelane, they are various, both with respect to the ground, and the paintings. Some are simple, as all blues, which are those usually seen in Europe; others are made up of several tints, and others are heightened with gold.

The blue is made of lapis lazuli calcined, and reduced to an impalpable powder by beating it in porcelane mortars not varnished, with pestles of the same matter. For red they put copperas in a covered crucible, in the lid whereof there is a little hole, which they heat with a reverberatory fire till the black smoke

ceases to ascend, and a fine red one succeeds it. By this process a pound of copperas yields four ounces of red liquor, which is found at the bottom of the crucible, though the finest part is that which adheres to the lid and sides. The powder of a white transparent flint, calcined like the lapis lazuli, is also an ingredient in several of their colours. The green, for instance, is made with three ounces of the scoria of beaten copper, half an ounce of powder of flint, and an ounce of ceruse. For violet, they add white to the green already prepared; and for yellow they use seven drachms of white, and three of the copperas red. Most of these colours are mixed with gum-water for application; a little saltpetre, sometimes ceruse or copperas, but more usually the latter, being first dissolved in the water. When the vessels are to be quite red, the colour is usually applied with the common varnish of the petunse; but there is another sort of red, called blown red, because applied by blowing through a pipe, one end whereof is covered with a fine gauze, on which the colour is spread, and by blowing at the other end the porcelain is sprinkled all over with little stains, which are exceeding beautiful. This sort of ware is very scarce, and of great value.—The black porcelain has likewise its beauty, whose colour has a leadish cast, and is usually heightened with gold. Three parts of lapis lazuli, with seven of the common oil of stone, make this colour, which is not applied till the porcelain be dry. Gold is prepared for application by breaking it and steeping it in water till a thin gilded cloud rises on the surface: It is used with gum-water, and to give it a body they add three parts of ceruse to thirty of gold.

There are several other kinds of porcelain, but such as are rather for ornament and curiosity than for use.

One of the prettiest is the magic porcelane, so called because the painting of the cups do not appear, unless they are filled with liquor. The secret of making these magic porcelanes is said to be almost lost among the Chinese, but our author informs us they must be very thin; and the colours, which on other cups are applied on the outside, are in these applied on the inside. When the colours are dry, they are covered over with a size made of the porcelane earth, and thus they are inclosed between two earthen laminæ. After the size is dry, they pour oil into the cup; and, when it is saturated therewith, they return it to the wheel to be made as thin and transparent as possible. The colours here used are always the finest, and the figures painted are fishes, which are suitable, as they seem to swim in the liquor.

The painting of the several kinds of porcelane being finished, and the colours dry, the next step is to polish them, to prepare them to receive the oil or varnish, whose composition has been already mentioned. This is done with a pencil of very fine feathers dipped in water, and brushed slightly over the porcelane, which takes off the least roughness or inequalities. It is then fit to be varnished, in which operation a great deal of care and skill are requisite, both that the varnish be laid on equally, and not in too large quantities; for it is applied thicker or thinner, and seldom or oftener repeated, according to the fineness of the porcelane.

We now come to the last preparation of this brittle ware, viz. the baking of it, for which purpose the Chinese have two kinds of ovens; large ones for such works as are only to be once baked, which is the common way; and small ones for those that require a double baking. The large ovens are two fathoms deep, and almost four wide, and the sides and roof are so thick

that one may lay one's hand on them when the fire is at its height, without danger of burning. They are built in form of a tunnel, having a large aperture at top to give vent to the smoke and flame, besides four or five small ones round them, which are opened or shut to diminish or augment the heat, like the holes called registers in the furnaces of chymists. Each oven is placed at the end of a long narrow passage, which serves instead of bellows, the wind being thus driven directly to the mouth of the furnace.

Every piece of porcelane of considerable value is disposed in the oven in a separate case or coffin; but as to tea-cups, and such small vessels, the same case serves for several. These cases are made of the same earth with the oven, and usually of a cylindrical form, that the fire may communicate itself the more equally to the porcelane inclosed. The bottom of each case is sprinkled over with very fine sand covered with dust of kaulin, that the sand may not stick to the work; and care is taken that the porcelane do not touch the sides of the cases. In the larger cases, which contain the small pieces, they leave the middle vacant, because the vessels placed there would want the necessary heat; and each of these little pieces is raised on a small mace of earth covered with powder of kaulin. The porcelane is put into cases lest the too violent effects of a naked fire should diminish its lustre; for it is owing to these thick coverings that the beautiful complexion of the ware is not tarnished by the excessive heat.

As fast as the cases are filled, a workman ranges them in the furnace, forming them into piles or columns, whereof those in the middle are at least seven feet high. The cases of the finest porcelane are placed in the center, and the coarsest at the bottom; and in this manner the whole cavity of the oven is filled

with piles, except that part directly under the large aperture. These piles are placed near one another, and are so bound together at top, at bottom, and in the middle, as that the flame may have a free passage among them, and insinuate itself equally on all sides; in which lies a great part of the workman's art, and on which the goodness of the porcelane much depends. Another thing they observe is, never to fill an oven with all new cases, but half new, half old; the old ones being set at the top and bottom of the pile, and the new ones in the middle. These cases are yellow before they are burnt, but afterwards they are of a dark red.

When the oven is full, the door or mouth is walled up, only a little hole being left to throw in small pieces of wood to feed the fire. It is then heated gradually for four and twenty hours; after which two men, who relieve one another, throw in fuel without intermission: And, what seems very strange to our author, the workmen thus employed about the furnaces drink hot tea with salt dissolved in it to quench their thirst. To know when the porcelane is sufficiently baked, they open one of the little holes above mentioned, and with a pair of tongs take off the covering from the top of one of the piles; and if these appear to be equally heated, and the colours of the porcelane uncovered have a noble lustre, they discontinue the fire, and close up the aperture left at the mouth of the furnace. After the fire is extinguished, if the baking consist of cups and such-like small vessels they let them remain in the oven about twelve or fifteen hours; but, if the porcelane be large, they defer opening it for two or three days: In which particular the modern practice differs from the ancient, where-

in all kinds of vessels remained in the oven considerably longer.

There is another sort of porcelane which is twice painted and twice baked, for which they have little ovens on purpose. Some of these are made of iron, and are very small; others of a kind of bricks, of the same earth with the porcelane cases. The largest of them, however, does not exceed five feet in height, and three in diameter, being built in the form of beehives. Round the oven, at about half a foot distance, is raised a shell of common bricks, joined to the oven itself by a kind of arch which serves to strengthen it; and four or five of these are usually built at equal distances from each other. At the bottom of the shell are holes to give air to the fire, and at the top there is an aperture, which is covered when the porcelane is put into the oven. The ware here is not inclosed in coffins, as in the larger furnaces, the oven serving for that purpose, and being so exactly closed that the vessels receive no impression of the fire but what proceeds from the charcoal disposed in the hearth at the bottom of the oven, and in the interval between the oven and external shell.

To prepare the porcelane for this second baking, it is varnished in the common manner; and having passed the great oven, it is then painted with various colours, after which, without any additional varnishing, it is ranged in piles in the little oven, the small vessels being placed upon the larger in form of pyramids. The intent of the second baking is sometimes to preserve the colours the better, and to give them a sort of relieve; but its more usual design is to hide defective places with the colouring, though the artifice is not difficult to be discovered.

Our curious author further observes, that the taste

for antiquity, which reigns in China as well as in Europe, gives the ancient porcelane a value far above the modern, infomuch that some workmen make it their business to counterfeit the former.—With respect to the dearness of porcelane, notwithstanding the vast quantity thereof which is made in China, he says it is chiefly occasioned by the frequent miscarriages in the baking of it, as it rarely happens that an oven succeeds throughout. Sometimes it is quite spoiled, so that upon opening it, instead of fine porcelane, is found a hard unformed mass, into which both the vessels and their coffins are converted, either by excess of heat, or some ill quality in the matter. Another reason of its dearness, besides the great profit of the European merchants and their factors, is the ingredients that it is made of, and the wood used in burning it, growing more and more scarce. To which a third reason, and that none of the least, may be added, viz. that most of the porcelanes made for Europe are formed on new models, frequently very difficult to succeed in, which yet for the smallest defects, are turned upon the hands of the manufacturer; and he, not being able to sell them to the Chinese, because not to their taste, is forced to put a higher price on the porcelanes he vends, to pay himself for those refused.

The reason of the japanned works executed at Canton not being so beautiful nor so much in request as those that are made in Japan itself, or at Tonking, and Nanking, capital of the province of Kiang nan, is not because the workmen do not use the same varnish and the same gilding, but because they make them in too great a hurry, and if they do but please the eye of the Europeans, they are very well satisfied.

If you would have a work well japanned, it must be done leisurely, a whole summer being hardly sufficient

to bring it to perfection. The Chinese seldom have any beforehand, or that has lain by for some time, for they almost wait for the arrival of ships before they begin, that their work may be agreeable to the European taste.

This varnish, which gives so fine a lustre to their pieces of work, and makes them so much esteemed by the Europeans, is not a composition, nor so great a secret as has been imagined by some people.

The varnish called Tsi by the Chinese is a reddish gum which distils from certain trees, through incisions made in the bark of the tree; these trees are to be found in the provinces of Kiang si and Se tchun; but those of the district of Kan tcheou, one of the most southern cities of Kiang si, yield the varnish of the most value.

These trees must be seven or eight years old before the varnish can be extracted from them, as that which is taken before is not near so good a sort. The trunk of the youngest trees from which they begin to get varnish are a Chinese foot in circumference, and a Chinese foot is much larger than the king's foot in France. It is said that which distils from these trees is better than that which is got from older, but then they yield much less; yet it is hard to say what foundation there is for this, because the merchants make no scruple of mixing them both together.

These trees, whose leaf and bark greatly resemble those of the ash, are seldom upwards of fifteen feet in height, and then the circumference of the trunk is about two feet. I have been told that they bear neither flowers nor fruit, and that they are thus multiplied.

When the tree begins to sprout in the spring season, they make choice of the most likely twig that proceeds

from the trunk and not from the branches; when the twig is about a foot long, they cover it with clay made of a yellow earth; this covering begins at about two inches above the place where it proceeds from the trunk, and is continued beneath four or five inches; the thickness of the covering is at least three inches; a mat is carefully tied over this, to preserve it from the rain and injuries of the air: It is left in this manner from the vernal to the autumnal equinox, and then they open the earth very carefully to examine the condition of the roots which the twig shoots forth, and which are divided into several strings; if these strings are of a yellowish or reddish colour, they judge that it is time to separate the root from the tree, and then they cut it dexterously without any injury to it, and afterwards plant it.

If these threads are still white, it is a sign they are too tender, and so they close up the earth again as it was before, and defer the planting of the shoot till the next spring; but whether it is planted in the spring, or autumn, there must be a good deal of ashes put into the hole that is prepared, otherwise the pismires would devour the tender roots, or at least get out all the sap, and so cause them to wither.

No other season but summer will do for extracting the varnish from these trees, for in the winter they yield none, and that of spring or autumn is always mixed with water; besides, these trees do not distil the least varnish during the day, but all in the night.

In order to procure the varnish they make several incisions in the bark round about the trunk, which must be deeper or shallower according to its thickness; the first row of incisions is about seven inches above the ground, at the same distance a little higher is another row, and thus from seven inches to seven inches, not

only to the top of the trunk, but even along such of the branches as are thick enough for the purpose.

They use a small crooked knife in making these incisions, which are made not directly downward but oblique, as deep as the bark is thick, and no more. He who makes them with one hand has a shell in the other, the edge of which he thrusts in as far as he is able, which is about half a Chinese inch, and this is sufficient to support the shell without any thing else. These shells, which are common in China, are much larger than our oyster-shells: these incisions are made in the evening, and the next morning they gather what is run into the shells; the next evening they fix them again in the same incisions, and so continue in this manner till summer is ended.

The merchants contract with the proprietors of these trees at the proper season, giving them about twopence halfpenny a plant, and hire workmen, who receive an ounce of silver a month for their labour; but if they have their meat found them, which is seldom the case, then they have but about three halfpence a day; and one of these people can manage fifty of these plants.

It is necessary to take some precautions to secure the workmen from bad impressions of the varnish, so that whether the merchant maintains them or not, they are obliged to have a large vessel of oil, wherein has been boiled a certain quantity of the filaments found mixed in hogs' fat, and which will not melt with the other part; the proportion is one ounce to one pound of oil.

The workmen carry with them a little of this oil when they go to place the shells in the trees, and with it rub the face and hands, and in the morning, when they have gathered the varnish and return to the merchants, they rub themselves more carefully with it.

After dinner they wash their bodies with hot water which the merchant has ready, in which they boil a certain quantity of the following drugs, which are all imagined to be of a cold nature, viz. Saltpetre in crystals, the outward bark of chefnuts, the bark of the fir-tree, and an herb which they eat in China and in the Indies, and is a sort of blits.

Every workman fills a little bason with this water, and carefully washes himself with it; but they make use of tin basons, not chusing to use the copper ones which the Chinese have for washing themselves in the morning.

When they work at the trees, they wrap their heads in a linnen bag, which they tie about their necks, and leave only two holes to see through; they cover themselves before with a sort of apron made of doe-skin, which they tie about their necks with strings; they have also buskins of the same, and long gloves on their arms: for it is very pernicious to the hands and face, and causes swellings and lameness, which it is almost impossible to cure.

When they gather their varnish they have a vessel made of neats' leather fastened to the girdle, with one hand they take out the shells, and with the other they scrape them with a small iron instrument till they have got out all the varnish; at the bottom of the tree is a basket, wherein they leave the shells till the evening. To render the gathering of varnish as easy as possible, the owners of the trees take care to plant them at a small distance from each other, and when the time of gathering it is come, they fasten with cords a great number of poles across from one tree to another, which serve instead of ladders to get up by.

The merchant takes care to have ready a large ear-

then vessel, on which is a wooden frame supported by four feet, like a square table whose leaf is taken off, upon the frame is a thin cloth fastened to rings by the four corners; this cloth is kept very slack, and on it they pour the varnish; that which is fluid runs thro' of itself, but they wring the cloth to make the rest run thro', and the little that remains in the cloth is placed apart, and sold to the druggists, because they sometimes make use of it in physic. When a thousand trees in one night yield twenty pound weight of varnish, they are considerable gainers.

When the gathering of the varnish is over, the merchant puts it in very strong wooden buckets. A pound of varnish, while it is fresh, is valued at about twenty pence, and the merchant gets double, or more, according to the distance of the place to which it is transported.

Besides the gloss which the Chinese varnish gives to the least piece of work it is applied to, it has also the property of preserving the wood, and preventing the least moisture from penetrating therein; whatever liquid matter is poured upon it, if it is wiped with a wet cloth it leaves no mark behind it, nor even the smell of that which was poured upon it; but there is a great art in applying it, for though it is naturally so good, yet it has need of a dexterous and careful hand to apply it as it ought; a great deal of skill and patience are necessary in the workman to find the just temper that the varnish requires, for if it be either too thick or too thin, it will make but a poor appearance.

They have two different methods of applying the varnish; the most simple is, to put it immediately upon the wood; after it has been well polished, they pass over it two or three times a kind of oil, called

Tong yeou by the Chinese; when it is well dried they lay on their varnish two or three times; it is so transparent that you see the grain of the wood clearly through it, and therefore if they would hide the materials they work upon, they lay on the varnish several times, and then it becomes so glossy that it resembles a looking-glass. When the work is dry they paint various kinds of flowers, men, birds, trees, mountains, palaces, &c. after which they lay varnish once more, as well to preserve it as to give it a gloss.

The other method, which is not so simple, requires more preparation, for it is laid upon a kind of small mastic, which has been before applied upon the wood; then they make a kind of pasteboard of paper, flax, lime, and some other materials well mixed, which they glue upon the wood, it making a very solid and smooth ground, upon which they pass the before-mentioned oil two or three times; afterwards they do it several times over with varnish, which they dry one after another. Every workman has his particular secret, which renders the performance more or less beautiful according to his skill.

When tea or other hot liquors are spilt upon these works, the lustre is frequently lost, the varnish tarnishing and becoming yellow: As a means of restoring the shining black that it had before, a Chinese author says, you must hold it a few hours amongst snow, or else expose it for a night to a white frost.

The Chinese have water-mills on most of their rivers, and are made use of in grinding the bark of trees to make pastils withal; the wheel of these mills is placed horizontally, and hath double fellows about a foot or a foot and half from each other; these fellows are united by little boards placed obliquely in such a manner, that in the upper part they leave an opening suf-

ficiently large, and on the lower part very narrow; the water that falls like a sheet two feet above these little boards, makes the wheel turn round pretty swiftly. They have also a prodigious number of hand-mills, which requires nothing more than strength of arms.

The invention of the Chinese is not so good as that of our mechanics, but the tools they make use of are more simple, and they can exactly enough imitate any pattern that is brought them from Europe; so that at present they can make clocks, watches, glass, muskets, pistols, and several other things, of which they were quite ignorant, or made but very imperfectly.

Among the other instances of their ingenuity, that practised in fishing appears not the least extraordinary. Besides the line, nets, and the ordinary instruments used in Europe, which they employ as well as we, they have two methods that appear extremely odd. The one is practised in the night by moon-shine; they take two long strait boats, and nail a board about two foot broad, painted white, and varnished, on the sides from one end to the other. This plank slopes outward, and almost touches the surface of the water: In order to answer their purpose, they turn towards the moon, that the reflexion of that luminary may encrease its brightness: When the fish playing and mistaking the colour for that of the water, spring up towards it, and either fall upon it, or into the boat. So that the fishermen with very little trouble soon fill their boat.

Another manner of fishing seems at first equally surprising: As the Europeans and others breed up hawks to fly at the game, and catch birds, they train cormorants to catch fish: One fisherman can easily look after an hundred of them: He keeps them perched on the sides of his boat, waiting patiently for their orders, till they are come to the place destined for fishing in,

and then at the first signal each takes its flight, and flies the way assigned it. It is pleasant to see them divide amongst themselves the whole breadth of the river, or of the lake: They seek up and down, they dive, come up again, and hover over the water till they perceive their prey; when they instantly dart upon it, seize it with their beak, and bring it to their master. When the fish is too big, they help one another interchangeably, one taking it by the tail and another by the head, in which manner they carry it to the boat, where the men hold out long oars or strong canes for them, on which they perch with their fish, which they do not part with till they go in search of others. When they are weary they let them rest a while; but give them nothing to eat till the fishing is over, during which time the throat of each cormorant is tied with a small cord, for fear they should swallow the small fish, which might prevent their having any inclination to return.

The manner of catching water-fowl in China, as well as in India and Mogul, is very curious. When the fowler spies his game, he wades with only his head above water, which is covered with a pot full of holes, to let in air, and give him sight. This pot is stuck all over with feathers, to deceive the game, so that when he draws near them, either by swimming or walking, they are not in the least frightened. The fowler then lays hold of them by the feet, drawing them down under water; and the rest of the fowls, thinking their companions have only divided, are not in the least disturbed, but keep swimming about the place, till they are at length most of them taken in the same manner.

The Chinese have a very singular method of dispersing all kinds of fish into different provinces even be-



fore they have life. About the month of May, they draw matts across the great river Yang tse Kyange in order to stop the spawn, which they know how to distinguish at first sight, though the water is scarce altered by it; with this water mixed with spawn they fill many vessels, which they sell to the merchants, who go thither in great numbers in this season to buy it, and transport it into different provinces. This they sell by measure to those who have fish-ponds belonging to their houses. In a few days the young fry begin to appear in shoals, but the different kinds of fish cannot be distinguished.

As it would be difficult to transport salt from the sea-coasts into the western parts that join with Tartary, Providence has wonderfully provided for their necessity: Besides the salt-pits that are met with in certain provinces, there are other places that have spots of grey earth scattered up and down, from whence they get a vast quantity of salt.

The way is very remarkable in which they get this salt: They level the surface of this earth as smooth as glass, and make it a little sloping, that the water may run off it; when the sun has dried it very well, and it appears white from particles of salt which are mixed with it, they raise it up in little heaps, then take it and spread it upon large tables that lean a little on one side, and that have ledges about four or five fingers high; then they pour soft water upon it, which soaking in extracts the salt, and runs into an earthen vessel by means of a channel made on purpose: This earth, thus drained, does not become useless, but is laid aside, and after a few days, when it is quite dry, they reduce it to powder, and lay it in the same place from whence it was taken, where after it has lain seven or eight days it is mixed again with par-

ticles of salt, which are again extracted from it in the manner above mentioned.

While the men are thus employed in the fields, the women and children are busy in huts built in the same place, in boiling the salt-water: They fill large deep iron basons, which they place over an iron stove, with holes made in it in such a manner that the fire heats all the basons alike.

After the salt-water has been boiling some time it grows thick, and changes by degrees into a very white salt, which they stir constantly with a large iron spatula till it is quite dry. A whole forest would hardly be sufficient to maintain the fire necessary for the salt which is made all the year, but as there are no trees, generally speaking, in these places, Providence supplies them with large quantities of reeds, which grow in the neighbourhood of these salt spots.

An immense number of barbers are perpetually walking the streets, with a little kind of bell to give notice of their approach to such as want to make use of them; they carry on their shoulders a stool, their bason, their kettle and fire, with a towel and comb-case, and immediately in the street, or in the middle of a square, or in a porch, or wherever else it is desired, they shave the head very dexterously, according to the custom of the Tartars; they set the eye-brows in order, clean the ear with instruments proper for that purpose, stretch out the arms, rub the shoulders, and do all this for the value of three farthings, which they receive very gratefully; after which they again ring their bell, and go in search of other customers.

A great many get their living by furnishing carriages to pass through the city, especially at Peking; you find in every square and cross street horses ready saddled, as well as mules and chairs, and may have

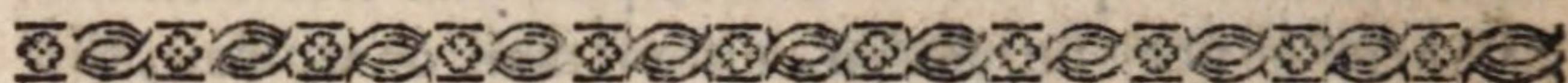
at all hours of the day, at any of these places, fifty or an hundred of these vehicles at a very moderate price.

In short, there is scarce any invention to which they have not recourse to find means of subsistence; for as there is not a spot in all the empire that lies untilled, so there is not one person, either man or woman, tho' never so old, deaf, or blind, but what may gain a livelihood. Things which appear very useless in other places a Chinese will make a profit of; a great many families in Peking gain a livelihood by selling matches; others have no other business but picking up in the streets little rags of silk, woollen, cotton, or linen, the feathers of fowls, bones of dogs, and bits of paper, which they wash and sell again.

If the Chinese would accompany labour and natural industry with a little more honesty, especially with respect to strangers, they would make complete merchants; but they seldom fail to cheat whenever it is in their power. They falsify almost every thing they sell; and in particular they counterfeit gammons of bacon so artfully, that people are often mistaken in them, and when they have boiled them a long time, they find nothing, when they sit down to eat them, but a piece of wood under a hog's skin.

Their subtlety in deceiving is still more extraordinary in their thieves and robbers, who break through the thickest walls, burn gates, and make great holes in them, by the help of a certain engine that fires the wood without any flame. Thus they penetrate into the most private recesses, and having, it is said, a certain drug, the fume of which stupifies the senses, and casts persons into a deep sleep, they enter into the very bed-chambers without being perceived, and when the people awake in the morning, they are surprised

to find their bed without curtains, their chamber unfurnished, and the tables, cabinets, coffers, and every thing removed, without any footsteps being seen of the thieves but the hole in the wall, at which they went out with all the furniture of the house.



Of the CUSTOMS and MANNERS of the CHINESE.

IN China, on the birth of a child, so far from carefully covering its head with several kinds of caps, according to the European practice, it is left bare as it came out of the mother's womb; and when nature has provided for its security against the impressions of the air, by the growth of the hairs which are to cover it, the parents are careful to have the head shaved, though yet tender, that, say they, it may be inured to an operation which it must be continually undergoing during life; a shaven head being now the mode in China, no less than a fine head of hair was formerly.

At least, did they use some precaution, as wearing caps, and covering their head in the night, there would be no great inconveniency in this constant shaving; whereas, in the severest cold, the ears of the Chinese are always exposed, the caps they use covering only the crown of the head, and scarce reaching to the forehead.

They always sleep bareheaded, though their apartments are damp, as being mostly on the ground-floor, and generally between court-yard and garden.

Princes, and some grandees, have wooden beds; but those of all other ranks, very few excepted, are made of bricks, with a quilt or two spread over them; but these quilts are so slight, that it seems strange so soft a people can habituate themselves to so hard a couch.

Now, heads thus shaven, and exposed to the inclemency and vicissitudes of the air, must naturally be subject to many disorders: accordingly a kind of deafness is so common, that a Chinese, in his fortieth or fiftieth year, is seldom free from it; and perhaps it is in consequence of this impediment to sound, that their music pleases them infinitely beyond ours; and they had rather hear a drum, a ring of bells, or the jangling of a few brass basons, than a concert of European instruments, with which we are so exquisitely affected. In China the human ear is universally long, broad, dangling, thick, open, and soft, with little or no border, and of a substance rather fleshy than cartilaginous.

Small eyes, a flat nose, an ill-shapen body, and a shaved head, make up the picture of a Chinese.

However industrious and temperate these people are, the prodigious number of inhabitants occasion a great deal of misery; there are some of them so poor that they cannot supply their inhabitants with the common necessities of life, for which reason they expose them in the streets, especially when the mothers fall sick, or want milk to nourish them; these little innocents are condemned to death in some sense, as soon as they begin to live; and this is very common in the great cities, such as Peking and Canton, but in the other cities such instances are but few.

This has inclined the missionaries in populous places to educate several catechists, who divide the whole city among themselves, and walk out every morning to baptize a multitude of dying children.

With the same view they have sometimes prevailed upon the infidel midwives to permit Christian women to follow them to the house where they are called, for it frequently happens that the Chinese, not being in a condition to bring up a large family, engage the mid-

wives to stifle the female infants in a basin of water as soon as they are born, upon which occasion these Christians take care to baptize them, and by this means these unhappy victims to the indigence of their parents, find everlasting life in the same water that deprives them of a short and transient being.

It is the same misery that produces a vast multitude of slaves, or rather persons who engage themselves to a condition from whence they cannot be redeemed; a great number of men and maid-servants are thus bound in the same family, though there are some who receive wages, as in Europe.

A man sometimes sells his son, and sometimes himself and wife, at a very moderate price, but if he can he is contented to engage his family only.

The rich, when they marry their daughters, give them several families of slaves in proportion to their wealth; it frequently happens that they gain their liberty, and some have half their freedom on condition that they pay yearly a certain sum; if some of them grow rich by their industry, or by trade, their master does not strip them of their goods, but is contented with large presents, and lets them live honourably, but will not consent to their redemption.

The generality of the Chinese are not tall, but well set, and have broad faces. They allow their beards to grow long on the upper lip and bottom of the chin. They pluck the hair from their cheeks with tweezers, and, till they arrive at thirty years of age, seldom any beard appears.

Those of the men who are esteemed learned, allow the nails of their fingers, especially those of the left hand, to grow near as long as their fingers, to distinguish them from mechanics.

A man that is tall and corpulent is much admir-

ed: and, added to this, if he has a broad forehead, small eyes, a short nose, and a long thin beard, he is looked upon as a compleat beauty. A strong voice is reckoned a fine accomplishment in a Mandarin of war, or a civil magistrate.

They travel generally on horseback, sometimes in chairs. Their horses are small, but nimble and sure-footed, and they use a sort of soft saddle, not much different from ours in Europe, but always keep very short stirrups, their knees being almost equal with the horse's shoulder. The chairs are made of bamboo, a sort of cane, and have no glass; in other respects they are much like ours; but those in which the ladies are carried are always provided with a lattice or blind to prevent their seeing or being seen. A piece of wood is placed cross from the end of one pole to the end of the other, which the chairmen lay upon their shoulders, and never carry the poles in their hands.

There are no barristers or lawyers in China; every man has liberty to manage his own cause; and if he thinks himself aggrieved by an inferior he may appeal to a superior court.

The Chinese women, who are not exposed to the heat of the sun, are as fair as any of their sex in Europe; and, except that they have generally very little eyes and short noses, may vye with them in beauty. Their foreheads are large: their eyebrows small and well arched; their eyes black, but almost hid with the lids; their mouth little, with plump lips of a deep vermilion colour; their checks and chins of a fine symmetry: their neck small, their arms long and slender, and a pretty little hand. The nails of the ladies fingers are never pared, but kept very clean: they allow them to grow more than two inches in length, to show that they are not employed in servile work.

They not only use the same kind of flesh, fish, and fowl that we do, but even horse-flesh is esteemed proper food. Nor do they reckon dogs, cats, snakes, frogs, or indeed any kind of vermin, unwholesome diet. But their common food is rice, roots, and garden-stuff, and pretty often broths and soups. Salt or pepper are never brought to table; these are only used in dressing. Their meat is broiled or boiled; and instead of bringing a large joint of meat to table, as the Europeans do, they have it all cut into square bits the size of dice before it is presented; nor do they use any table-cloth, napkins, spoons, knives and forks; instead of which, they use two little short sticks of ebony tipped with silver, with which they lift their meat very dexterously. They hold the cup near their lips, which contains the rice and broth, and convey them into their mouths very expeditiously with the same small sticks. They, contrary to the custom of all the other eastern nations, have their tables and chairs very high: and, at an entertainment, each person has a square table to himself, on which meat and rice are served in plate or china cups and saucers. The better sort feed very luxuriously; they eat their meat cold, but their liquor hot. Tea is their principal liquor, which they always drink without sugar. In the morning a large tin vessel is made full of it, to serve the family for that day. This tin vessel is covered very close, and put into another vessel of wood, which keeps the tea warm all day, and is drawn off into cups by a screw-cock. This coarser kind is used by the family in common, as I could not discover they drank any thing else. But, when company is in the house, every person has a cup with a close cover set before him, and tea of such kind or quantity as the person pleases is put into it; after which a servant at-

tends with a sauce-pan of boiling water to pour into each cup.

The water in China is seldom drank cold; and indeed it is not very safe, till herbs are infused into it, or till it is boiled or mixed with spirits; for their water is seldom pure.

They have no wine, though they have plenty of grapes; nor do they brew any liquor from barley: yet they have several strong liquors which they make from rice or wheat, of which the most common are Hockshue and Shamshue: the first is of the colour of our English brown beer, and very strong, and very clear. I am told that it is no other than an infusion of wheat in scalding-hot water; it drinks more like mum than beer. Shamshue is a spirit distilled from rice, and is either of a pale or a reddish colour. It drinks best hot; and our European sailors, who use it much while here, all agree that it is wholesome, and never causes headaches and sickness after it, as their other liquors do, when they get drunk.

The seraglio in the court of Peking contains a collection of the most beautiful virgins in the empire. These the vice-roys, and governors of the several provinces make presents of to the emperor, who uses them indeed no better than his slaves; for they are so numerous, that many of them are hardly ever known by him.

The female sex are excluded from having any share in the civil government and councils. The Chinese, by way of derision, style Europe "The ladies empire," from the information that women are sometimes invested with sovereign power in that quarter of the world.

Some of the fair-sex procure an article in their marriage settlement, that they shall have liberty to enter-

tain gallants; and in such cases the lovers resort as confidently to her apartments as her husband. But the Chinese generally hold this practice in such abhorrence, that the children of such women are disqualified to hold any place, or procure preferment in the state.

Some parents, when they apprehend that they shall not be in a condition to maintain their male children, will castrate them, in order to provide for them as eunuchs in the emperor's seraglio. They are called Gelubden; and no other are permitted to come near the women's apartment, or to attend in the innermost courts of the palace. Yea, so sacred are the women's apartments in general, that the husband's father is not permitted to enter them. And if the father would punish his son for any offence, which, by the law of China, he may do after marriage, if the son escapes into his wife's apartment, he is as safe as in a sanctuary. If daughters are not married in their father's life-time, their brethren are obliged by law to provide for them.

The women employ themselves in painting, embroidery and needle-work, but never meddle with trade or merchandize. In their retirement, they keep collections of birds, dogs, and other entertaining animals, to amuse them.

The Jesuits so greatly extol the piety of the female converts that they had proselyted here, that they tell us, if China should once embrace Christianity, all the female sex would be saved.

It is said that the Chinese ladies rub their faces every morning with a kind of paint that sets off the whiteness of their complexion, and gives them a colour, but presently spoils their skin, and makes it full of wrinkles.

Among the charms of the sex the smallness of their

feet is not the least; when a female infant is born, the nurses are very careful to bind its feet quite close, lest they should grow too large. The Chinese ladies are subject all their lives to this constraint, which they were accustomed to when in their childhood, and their gait is unsteady, slow, and disagreeable to foreigners: yet such is the force of custom, that they not only undergo this inconvenience readily, but they increase it, and endeavour to make their feet as little as possible, thinking it an extraordinary charm, and always affecting to shew them as they walk.

It is hard to imagine what is the reason of such an odd custom, for the Chinese themselves do not pretend to be certain, looking upon that story to be fabulous, which attributes the invention to the ancient Chinese, who, to oblige their wives to keep at home, are said to have brought little feet into fashion. The major part think it to be a public design, in order to keep the women in constant dependance. It is very certain that they seldom stir out of their apartment, which is in the most inward part of the house, having no communication with any but the women-servants.

However, they have, generally speaking, the common vanity of the sex, and though they are not to be seen but by their domesticks, they spend several hours every morning in dressing and adorning themselves.

The Chinese love to be clean and neat in their houses, but they have nothing very magnificent; their architecture is not at all elegant, and they have no stately buildings but the emperor's palaces, publick edifices, towers, triumphal arches, the gates and walls of the great cities, piers, causeways, bridges, and pagods. The houses of private persons are very plain, for they have no regard to any thing but usefulness. Those that are rich add ornaments of Japan work,

sculpture, and gilding, which render their houses very pleasant and agreeable.

They for the most part begin with erecting their pillars and placing the roof thereon, because the greatest part of their building being of wood, they have no occasion for laying a foundation low in the ground, the deepest is about two foot; they make their walls of brick or clay, and in some places they are entirely of wood: these houses are generally nothing but a ground-floor, though those of the merchants have frequently one story above it called Leou, where they place their goods.

The greatest part of the houses in the cities are covered with tiles, which are half guttered and very thick; they lay the convex part downward, and to cover the chinks in those places where the sides meet, they lay on new tiles in a contrary position. The spars and joists are either round or square; upon the spars they lay very slender bricks in the shape of our large quarrels, or small pieces of boards, or matts made of reeds, which are plaistered over with mortar; when it is a little dry they lay on the tiles; those who are able to be at the expence, join the tiles together with mortar made of lime.

In the generality of their houses, when you are through the porch, there is a hall toward the south about thirty or thirty five foot long; behind the hall there are three or five rooms to the east and west, the middle room of which serves for an antichamber; the roof of the house is supported by pillars in the following manner; for instance, if the hall be thirty foot long it will be at least fifteen broad, and then twenty-four pillars support the roof forward, and the same number backward, and one at each end; every pillar is erected upon stone bases, and they support the large

beams laid lengthwise upon them, and between every two pillars they put a beam or piece of wood across; upon the great beams, and on the two pillars at the ends, they lay other pieces of wood that support the bulk of the roof, after which they begin to build the walls; the pillars are commonly ten foot high. The magnificence of the houses, according to the Chinese taste, consists in the thickness of the beams and pillars, in the excellency of the timber, and in the curious carving on the gates. They have no other stairs than what are before the door, which consists of a few steps above the level of the ground: but along the side of the house there is a close gallery, about six or seven foot wide, and cased with beautiful free-stone.

There are several houses where the gates in the middle of each side of the house answer to one another. The houses of the commonalty are made of unburnt brick; in some places they are made with tempered earth, and in others there are no walls at all, except what are made of hurdles covered with lime and earth.

But among persons of quality the walls are made of polished bricks, very curiously carved. In the country towns, especially in some provinces, the houses are chiefly made of earth, being very low, and the roof makes so obtuse an angle, that it seems almost flat; it is composed of reeds covered with earth, and supported by matts of small reeds that lie upon the pannels and joists. There are some provinces where they make use of coal, or else reeds or straw instead of fire-wood. As they use stoves with small chimneys, and sometimes none at all, if the coal is burnt in other rooms besides the kitchen, you are almost stifled with the smell, and more so if the fuel be reeds, which is unsupportable to those who are not used to it.

The houses of the nobility and rich people, if compared with ours, do not deserve to be mentioned; it would be an abuse of the term to call them palaces, they being nothing but a ground-floor raised something higher than common houses; the roof is neat, and the out-side of it has several ornaments; the prodigious number of courts and apartments, fit to lodge their servants, make amends for their meanness and want of magnificence.

The Chinese, notwithstanding all this, are not haters of pomp and expence, but the custom of the country, and the danger there is in doing things out of the common road, restrain them contrary to their inclinations. The tribunals of justice have nothing very extraordinary in them: the courts are large, the gates lofty, and sometimes adorned with carved work sufficiently neat, but the inner rooms and places of audience have neither grandeur nor neatness.

The chief ornaments that their halls and apartments are adorned with being well kept, appear very beautiful and neat to the sight: there are large silk lanthorns painted and hung up to the ceiling, tables, cabinets, screens, chairs handsomely varnished with red and black, so very transparent that you see the veins of the wood through it; and as bright as the surface of polished glass; variety of figures of gold and silver, or other colours painted upon this japan give it a new lustre: besides the tables, the buffets and cabinets are adorned with the fine china-ware, which is so much admired, but could never be imitated in Europe.

Besides this they hang up in several places pieces of white satin, on which are painted flowers, birds, mountains and landships; on others they write in large characters moral sentences, wherein there is always some obscurity; they are taken out of histories, and have fre-

quently a different sense from the natural: these sentences are commonly by pairs, and are conceived in the same number of letters. Some are contented with whitening their rooms, or papering the walls, in which the Chinese are very skilful.

The great men in China follow the example of the western Asiatics, in keeping eunuchs to attend them; who are their counsellors, and chief confidants on all occasions. Their business is to take care of the women, and being in a manner detached from the world, they are greatly respected. Castrating is a trade in China; and so skilful and dexterous are the performers, that few die under their hands. I was acquainted with a man who, being reduced to low circumstances, sold himself to be made an eunuch, after he was thirty years old.

All the people of fashion in China cause their coffins to be provided in their life-time, and those of the higher rank cause their tombs to be built; and each family has a particular burying-place, to which the deceased of that family, though dying at a great distance, must be brought. The burying-places of the common people are without the city; they are generally buried promiscuously. By their law, the corpse of a person who had died in the country, must not be brought within the walls of the city, nor is any burying-place allowed within the walls. Their coffins, which are commonly varnished, and sometimes carved and gilded, are made of a durable wood, upwards of six inches in thickness.

When a man of fortune dies, his nearest relation informs all his friends of it: they convene, they wash and perfume the corpse, and dress the deceased in the best cloaths he used to wear. Then placing the dead body, thus dressed, in a chair, the wives first, then the

children, and afterwards the relations and friends of the deceased, prostrate themselves before the corpse, and passionately bewail their loss. The third day the body is put into a coffin, covered with a piece of silk, and placed in a large room, which is hung about with white linen, and has an altar erected in the middle of it, with a picture or statue of the deceased placed upon it. The relations are again introduced, bringing with them wax lights and incense, which they burn upon the altar, and again prostrate themselves before it. Meantime all the sons of the deceased, cloathed in linen, and girt about the middle with a cord, stand on one side of the coffin, in a mournful posture; while the mothers and the daughters stand on the other side, behind a curtain, lamenting in such strains as custom requires; the attending priests all the time singing mournful songs. During the time of keeping the corpse, there are tables well furnished every morning, and the priest is butler at night. A large sheet of paper is hung over the gate, expressing the name and quality, and giving a short detail of the life and great actions of the deceased. The corpse is sometimes thus kept for months, and all the sons of the deceased sleep about his coffin on matts or plaids. They taste neither flesh nor strong drink, nor come near their wives, all this time. Yea, so superstitious are they in performing the funeral rites, that their law prohibits the sons of the deceased to be at any entertainment, or to be concerned in any business for the space of three years after the father's death; and, though a man were possessed of the highest place in the government, he is obliged to leave it on such occasion for three years, and to retire to his own house, where it is esteemed an indecency to indulge himself in any pleasure, or even to be seen to laugh. The soldiers and Mandarines of

the military order are the only persons exempted from this lengthned mourning for a father.

Upon the day appointed for the burial of the corpse, the relations are assembled the third time, to follow the deceased to the place of interment. In the procession, first, several images of men, women, elephants, lions, and other animals, which are made of painted paper, in order to be burnt at the grave, are carried in the front. Next, figures of triumphal chariots, castles, and the like, are supported by men under them, attended by tables of rich perfumes and meats. After which follow the priests in their robes, with drums, musick, and bells. Then the coffin, carried by twenty or thirty men under a canopy, and followed by the sons on foot, leaning on crutches, as if they were scarcely able to support themselves. After them come all the mothers and daughters carried in close chairs, covered with white silk or linnen; and though they cannot be seen, they deafen the company with their perpetual howling, and sometimes other women are hired to howl on such occasions.

Mountains, and solitary places far from towns, are chosen for the seat of the tombs and sepulchres of the great, some of which are very magnificent. If a tomb is erected in a valley or plain, a vast heap of earth is accumulated over it, to the height of a mount. The tomb is an arched vault, about the size of an ordinary cottage, covered with Paris-plaster, so as no moisture can penetrate. A wide door opens in the entry to it, and two smaller ones on each side. In the vault an altar is erected, lights are placed, and the friends and relations prostrate themselves before it, with their faces to the ground. On this altar they pour out wine, offer meats, and burn incense, with the pictures of men and animals on gilded paper, which they imagine, are

converted into the things they are made to represent, and that they will be of service to the dead in another state. And if the deceased has held any considerable office, his virtues and illustrious actions, real or imaginary, are engraved on marble, and set up in the vault before the altar.

One chief reason of the dislike of the Chinese to all foreigners, is, because they leave the tombs of their ancestors to go to distant climates; but the Chinese have such veneration for the burying-place of their fathers, that neither curiosity nor the love of gain can allure them to travel into remote parts of the world. They even despise their own countrymen, who, from necessity, or on account of trade, go to Sunda, or other islands, to reside; because there they imagine they must leave their bones in unhallowed ground. It is little wonder therefore, that the Chinese are so seldom to be met with in very distant nations.

If a husband dies, the wife must mourn three years; and it is accounted infamous for her to marry again.

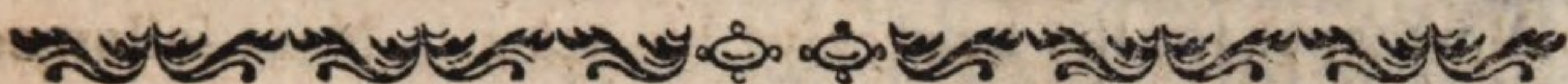
Funeral pomp and ceremony is here so much regarded, that the emperor himself, though he bestows no hereditary honours on any of his subjects while living, frequently confers honours and titles on such as he thinks have deserved well, after their death. The present emperor's father, I was told, had bestowed a great many honours on a favourite popish missionary, who had served him in quality of a Mandarin and president of the college of the *literati*. At his funeral there was an odd mixture of popish and pagan superstition. One of the missionaries says, that the emperor wrote with his own hand the following encomium upon him.

“Whereas father Verbiest left Europe to come into
 “my dominions, and spent the best part of his life in
 “my service, and, during all the time he presided o-

“ ver the mathematicians, his predictions never failed,
 “ but agreed exactly with the motions of the heavens;
 “ and as he was ever faithful and indefatigable in his
 “ labours till he had finished his course; therefore I
 “ ordered my own physician to attend him; and as soon
 “ as I knew that a deep sleep had seized him, my heart
 “ was wounded with inexpressible grief. I have there-
 “ fore ordered two hundred golden crowns towards his
 “ funeral charges; and it is my pleasure that this de-
 “ claration be published, to testify the sincere affection
 “ I had for father Verbiest.”

The corpse of the Jesuit was laid in state after the
 Chinese manner. Two Mandarines were dispatched
 by the emperor, with the above instrument. They
 kneeled before the coffin, and, with apparent weeping
 and lamentation, bowed their head several times to the
 ground. Then they rose, and read the emperor's de-
 claration. The great lords of the court, in imitation
 of the emperor, wrote panegyrics upon the missionary.
 These were written upon white satin, and hung
 round the room; but the emperor's was wrote on a
 large piece of yellow satin, and hung near the corpse.
 The morning of the day appointed for the burial, the
 emperor sent his father-in-law, to represent his person.
 A chief Mandarine, a gentleman of the bed-chamber,
 and five officers of the household, attended him. They
 all prostrated themselves before the corpse, and seemed
 to weep bitterly; for I am told not even the fair sex
 themselves have a greater command of their tears than
 the Chinese courtiers. In the front of the funeral pro-
 cession, a trophy thirty feet high was carried, on which
 the name and titles of honour of the missionary were
 written in large golden letters. In the second order
 a large red cross, decorated with flags and streamers,
 was carried by two files of Christians, cloathed in white,

each having a lighted taper in one hand, and a handkerchief in the other to receive his tears. Next followed the picture of the Virgin Mary in a large frame, supported by some Chinese converts; and after it, the image of St. Michael. The emperor's encomium, carried like a military standard, and surrounded by a crowd of Christians, followed. After these came the coffin, varnished and gilt after the manner of the country, supported on a bier by sixty people. And lastly, the popish missionaries, the lords deputed from court, and a multitude of Mandarines, closed the procession. At the tomb the missionaries read prayers, sprinkled the corpse with what they call holy water, and perfumed it with incense. After the corpse was let down into the vault, the missionaries remained on their knees, to hear what the emperor's father-in-law had to say to them. He declared to them, that father Verbiest had been so serviceable to the emperor and the state, that he was deputed, with the lords present, to make this publick acknowledgment, that all the world might know the affection the emperor had for him whilst he lived, and how much he bewailed his death. The missionaries paid their respects to him, in return, by a handsome speech. The court of rites finding how acceptable it would be to the emperor to confer some further marks of honour on this missionary, they ordered seven hundred golden crowns to be laid out in adorning his tomb, and in engraving the emperor's encomium on a marble stone.



Of the Dress of the CHINESE.

THE head-dress of the Chinese ladies consists of several curls interspersed with little tufts of gold and silver flowers. Some of them adorn their heads with the figure of a bird called Fong hoang, a fabulous bird, several mysterious things concerning which are to be found in antiquity. Some of these birds are made of copper, others of silver gilt, according to the person's rank: Its wings extended lie pretty close on the fore-part of their head-dress, and embrace the upper part of their temples; its long spreading tail makes a kind of plume on the middle of the head, the body is directly over the forehead, the beak and neck is joined to the body of the animal by a concealed hinge, in order that it may easily play and answer to the least motion of the head. The whole bird lies principally upon the head, and the claws are fixed in the hair. Ladies of the first quality commonly have an ornament of several of these birds united together, which form a kind of crown; the workmanship of this ornament is very expensive.

The young ladies for the most part wear a kind of crown made of pasteboard, and covered with fine silk; the fore-part of this crown rises in a point above the forehead, and is covered with diamonds, and other ornaments; the upper part of the head is adorned with flowers either natural or artificial, mixt with small bodkins, the ends of which shine with jewels. Elderly women, particularly those of the common sort, are contented with a piece of fine silk wrapt several times

round the head, which they call Pao teou, which means, A wrapper for the head.

The uncommon modesty which appears in the looks and dress of the Chinese ladies sets off their natural charms; their gowns are very long, and cover them from head to foot in such a manner that nothing can be seen but their face. Their hands are always concealed under long wide sleeves, that would almost drag on the ground if they were not careful in keeping them up. Their garments are of various colours, red, blue, or green, according to their fancy; but violet or black is worn by none but elderly ladies.

What we in Europe, where the dress is subject to so many changes, call the fashion, is quite a different thing in China; for they have had but one kind of dress from the beginning of the empire till the Tartars subdued it, who, without changing the antient Chinese government, have only made them dress in the manner they did.

The men's garments are made agreeable to the gravity they so much affect; they wear a long vest which reaches to the ground, having one lappet folded over the other in such a manner that the upper lappet reaches to the right side, where it is fastened with five or six gold or silver buttons at a small distance from each other. The sleeves that are large towards the shoulder grow narrower by degrees towards the hand, and end in the shape of a horse-shoe, which cover their hands, and hide every thing but their fingers from being seen. They gird themselves with a large silken sash, the ends of which hang down to the knees.

The Tartars stick a handkerchief to it on both sides, with a sheath for a knife and fork, and tooth-pick, a purse, and other pretty implements. In summer their

neck is all bare, which looks very ill, in winter they cover it with a collar of fatten fastened to the vest, or with a tippet of fable or fox-skin, about three or four fingers broad, which is fastened before with a button, which is very decent, and becomes horsemen wonderfully.

The Chinese are always booted, and when any one pays them a visit, if they chance not to have their boots on, they make them wait till they go fetch them.

The form of these boots is somewhat different from ours, for they have neither heel nor top; when they ride any long journey, they are made of obsolete, old fashioned leather, or thick, black, pinked cotton; but in the city they usually wear them of fatten, with a coarse border of plush or velvet upon the knee. The people in public, and persons of quality within doors, are instead of shoes, shod with pattins of black linnen, or some pretty silk, very convenient; they stick close to the foot of themselves, by a border that covers the heel, without needing to tie them before.

In the summer-time they wear a pair of linnen drawers under the vest, which they sometimes cover with another pair of white taffety, and during the winter they wear fatten breeches, with cotton or raw silk quilted in them, but if it be in the northern parts they are made of skins which are very warm. They make their shirts of different kinds of cloth, according to the season, and are very wide and short; and, to keep their garments clean from sweat during the summer season, several wear a kind of silken net next to their skin, which prevents their shirt from sticking to it.

Their vest in the winter is lined with sheep-skin, though there are some who wear it only stitched with silk and cotton; people of quality line it quite thro'

with fable imported from Tartary, or fine fox-skin with a border of fable. They line them with ermine in the spring; and over the vest they wear a furtout with large short sleeves, which are lined and bordered the same way.

The Chinese formerly greased their hair very much, and were so fond of this ornament, that after their country was subdued, and the Tartars obliged them to shave the head, several chose rather to die than obey the conquerors in this point, though their masters did not alter the other customs of the nation. At present they have their heads shaved, except on the hind part or in the middle, where they suffer it to grow as long as they think proper.

In summer they wear on their heads a kind of small hat or cap, made in the shape of a funnel; the inside is lined with sattin, and the outside is covered with rattan or cane very finely wrought; a large tuft of red hair is put to the top of the cap, which spreads to the very edges, and covers it: This hair is very fine and light, and grows between the legs of a kind of cow, and is dyed of a very bright red; this is very much in fashion, and allowed to be worn by all sorts of people.

There is another that the vulgar are prohibited from wearing, it being proper to Mandarines and men of letters, of the same fashion as the others, but made of pasteboard between the two sattins, the inside of which is generally red or blue, the outside is white sattin covered with a large tuft of the finest red silk. People of distinction make use of the former when they chuse, but especially on horseback when the weather is bad, because it keeps out rain, and prevents the sun from troubling them.

They wear in the winter a very warm sort of cap bordered with ermine, sable, or fox-skin, the upper part of which is covered with a tuft of red silk. This border of fur is two or three inches broad, and looks very pretty, especially when it is made of fine black shining sable, and costs forty, and sometimes fifty taels.

When they visit any person of quality, or go abroad, they wear a long silk gown, for the most part blue, girded about them, over which they have a black or violet cloak that almost touches their knees, which is very wide, and has very wide and short sleeves, and also a little cap made in the fashion of a short cone, covered with tufts of silk or red hair, a fan in their hand, and stuff boots on their legs.

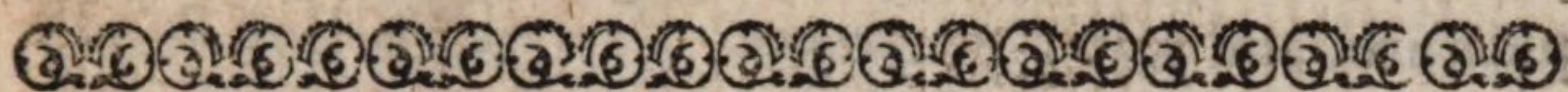
The colour of their mourning is white among princes as well as mechanics; those who have a compleat mourning habit have their cap, vest, gown, stockings, and boots all white. In their first months of mourning for their parents their habit is a kind of linen bag of a bright red colour, and as coarse as a packing-cloth; their girdle is a kind of cord, and their cap of a very odd figure is likewise hempen cloth. This melancholy and negligent outside they affect to discover their inward sorrow for being bereft of so dear a friend.

The soldiery in China are dressed most in blue Nanking stuff, their gowns short and narrow, with rattan caps on their heads, and a bunch of red hair fixed on the top of them; which, when they perform any quick motion, or are agitated by the wind, make a grand appearance, especially when four or five thousand of them are marching in a body. Their boots are made of silk, and lined with cotton. Their principal arms are the sword and the bow.

Their swords, which are very large, heavy and broad, they wear on their left side, but with the handle behind, and the point hanging down forwards. When they draw them, they with their left hand take hold of the lower end of the scabbard, and lift up the sword behind them so high, as that the handle may reach above the shoulder behind; so that, at the drawing the sword with the right hand over the left shoulder, they can make a nimble and severe stroke. However impossible or inconvenient this may seem to those who have not seen it performed, yet it is absolutely certain, that they do it with great ease and agility, the effect, no doubt of constant practice.

Their bows are very large and strong. They carry them in a case on their left side, and a case of arrows on their back. On their right thumb they wear a broad and thick ivory or agate ring, upon which they place the string when they draw: and they have another ring on the left thumb for the arrow to run upon when they shoot.





*Of the FESTIVALS and DIVERSIONS of the
CHINESE.*

AMONG the festivals of the Chinese there are two principal ones that are celebrated at a prodigious expence; the one is the beginning of their year, and the other, which is on the fifteenth of the first month, is what they call The Feast of Lanthorns. All business is then stopt, and the tribunals are shut up throughout the empire.

This is a time of great merriment, especially at the conclusion of the old year, and the vacation lasts a whole month. Their inferior Mandarines go to salute the superior, the children their fathers, servants their masters, &c. In the evening the whole family meet together, and a great feast is made. Some of them are very superstitious, and will not admit a stranger among them, nor yet one of their own nearest relations, for fear that the moment the new year begins they should take the happiness which should descend on the house, and carry it away to the prejudice of their host: On this day every one closes himself up in his own house, and rejoices with his family; but on the next and following days, they give demonstrations of extraordinary gladness, all the shops are shut up, and every body is employed in feasts, sports and plays; the meanest mechanic on this day dresses himself in his best cloaths; the wealthy dress themselves sumptuously, and visit their friends and relations, and all those whose favour they court: They act plays, treat each other, and mutually wish all kinds of prosperity; in short, the whole em-

pire is in motion, and nothing is heard but mirth, pleasure, and joy.

The fifteenth of the first month is also a solemn festival, and every place throughout the empire is so illuminated, that if one could take a view of it from some high place all the country would seem to be on fire. The festival begins on the thirteenth in the evening, and is continued to the sixteenth or seventeenth; every person, both in city and country, on the sea-coast, or on the rivers, light up painted lanthorns of several fashions; the poorest houses that are have them hung up in their courts and at their windows, every one being desirous to distinguish himself; the poor do it at a small expence, those that are rich lay out sometimes two hundred Franks, and the chief Mandarines, the viceroys, and the emperor expend on this occasion three or four thousand livres.

It is a spectacle to all the city, people flock thither from all parts, and to satisfy them the gates of the city are left open every evening; they are permitted to enter into the tribunals of the Mandarines, who take care to adorn them in a splendid manner to give a notion of their magnificence.

These lanthorns are very great, some are composed of six parts; the frame is made of japanned wood, adorned with gilding; on every square they spread some fine transparent silk, on which is painted flowers, trees, animals, and human figures; others are round and made of transparent horn, of a blue colour, and extremely handsome; they put in these lanthorns several lamps, and a great number of candles, whose light make the figures look very lively; the top of the machine is covered with diverse carved works, from whence hang several streamers of sattin and silk of diverse colours.

Several of them represent spectacles very proper to amuse and divert the people; you see horses galloping, ships sailing, armies marching, dancings, and several other things of the same nature; people who lie concealed, by means of imperceptible threads, put all these figures in motion.

At other times they cause shadows to appear that represent princes and princesses, soldiers, buffoons, and other characters, whose gestures are so conformable to the words of those who move them with so much artifice, that one would think the shadows spoke in reality: There are others who carry a dragon full of lights from the head to the tail, from sixty to eighty foot long, which makes the same windings and turnings as a serpent would do: That which gives a new splendor to this feast are the fireworks which are seen in all parts of the city, for it is in this the Chinese are thought to excel. F. Magaillaens relates, that he was extraordinarily surprized with one of these fireworks, where a vine-arbour with red grapes was represented, and the arbour burnt without being consumed; the foot of the vine, the branches, leaves, and grapes, were consumed exceeding slowly; there was the appearance of red grapes, green leaves, and the colour of the wood of the vine was represented so naturally, that any person might have been deceived by it: But these matters may be judged of more exactly from the description of one that the late emperor Chang hi caused to be made for the diversion of the court; those of the missionaries who were in waiting were witnesses of it: The fireworks began with half a dozen large cylinders planted in the earth, which formed in the air as many streams of flame that rose up to the height of twelve foot, and fell down again in golden rain or fire; this spectacle was followed by a covered firework carriage,

supported by two stalks or pillars; from whence proceeded a shower of fire, with several lanthorns, and sentences wrote in large characters of the colour of burning sulphur, and afterwards half a dozen of branched candlesticks in the form of pillars, of diverse stories of lights placed in a circle, the light of which was like silver, which in a moment turned night into day; at length the emperor, with his own hands, set fire to one of the works, and in a short time it was communicated to all sides of the place, which was eighty foot long, and forty or fifty broad: The fire was fastened to several poles, and paper figures placed on all sides, from whence proceeded a prodigious number of rockets playing in the air, with a great number of lanthorns and branched candlesticks that were lighted in every place.

This sport lasted for half an hour, and from time to time there appeared in some places violet and bluish flames in the form of bunches of grapes in a vine-arbour, which, joined to the splendor of the lights that shone like so many stars, yielded a very agreeable sight.

Among the ceremonies that were observed there was one very remarkable: In the greater part of the houses the heads of each family wrote in large characters on a sheet of red paper or japanned board the following words, "Tien ti, San kiai, Che fan, Van lin, Tchín teai;" the sense of which is this: "To the true Governor of heaven and earth, and the three limits, [that is, Of the whole world], and to the ten thousand intelligences." This paper is put into a frame, or pasted to a board; they place it on a table in the court, on which is set corn, bread, meat, and such like things, then prostrating themselves on the earth they offer sticks of pastils.

Gaming, though prohibited by the Chinese laws, is much practised amongst them, and there are instances of those who have followed it so immoderately, that they have played away their estates, wives and children; any of which they will sometimes hazard upon a card, or a single cast of a die.

The Chinese call chess The game of the elephant, and say that they had it from the Indians in the reign of Vouti, about the year of Christ 537.

In China young maids are taught chess; and it is reckoned a part of their education; so that it seems to hold the same place with them that dancing does with us.

It is a common thing for the Chinese to act a play before their idols, after their worship is over. I have seen several acted in different Joss-houses, and every body is welcome to see them gratis. Sometimes these smaller temples are so crowded by the poorer sort of people among the Chinese, that an European can scarcely get in. In summer the people are mostly naked; and, as they stand closely together the whole time, there is such heat, sweat, and stench, that an European cannot set his nose within doors.

I have frequently seen plays acted upon open scaffolds erected in the public streets of Canton: and those in half a dozen streets at a time. Their actors are richly dressed, and have a large stock of dresses and military arms and trinkets.

Their costly dresses, &c. are kept in square chests. In the temples they have dressing-rooms; on each side the stages they have screens. They have few or no painted scenes, &c. Persons wait within the screens ready to dress or undress them as occasion requires.

When they act in the street, they are paid by the

inhabitants of that street; when they act in temples, it is at the charge of the members of the temple, or him who, on any particular occasion, employs them. As none of the fair sex are allowed to appear on a stage, they employ young men or boys of an effeminate air and countenance to act the woman's part. Some companies of actors consist of men from twenty to forty years of age: and these are in the most esteem among the Chinese. Others consist of young men between twelve and eighteen; and these are most esteemed by the Europeans. They have both tragic and comic performances. These, especially the first, they seem to act with great propriety both of gesture and expression. They represent the workings of the passions so naturally, that they often affect very sensibly even an European spectator, though ignorant of the language with which this action is accompanied.

The subject of their plays is generally the life and heroic actions of some brave man among their ancestors. Some of my Chinese acquaintance told me, that these plays were instituted, and often repeated, to recommend bravery and virtue, and to ridicule vice; and to give the mob an idea of the constitution, the different degrees of dignity in the empire, and the authority and manners of the court; which, in such an extensive empire, the common people could not be otherwise informed of.

The whole streets are so filled on these occasions with a pleased and attentive crowd, that you cannot pass by. When an actor plays his part well, the mob all unite in calling him to return to the stage, and re-act his part. I have seen young boys, resembling women, in beauty, effeminacy and dress, act the female's part so well, that the mob obliged them to act it three times over before they were allowed to leave the stage.

The plays are generally concluded with tumbling, fighting, or combating with giants or wild beasts; or else with some humorous postures, gestures, and expressions, calculated to raise a laugh.

When the emperor goes a hunting, he makes choice of three thousand of his life-guards, who are armed with darts and javelins. These he disperses in such a manner, that they quite surround a very large extent of ground on the mountains. The life-guards thus posted form a kind of circle, the diameter of which is three thousand paces at least. Marching afterwards nearer to each other with an equal pace; taking care not to quit their ranks, what obstacles soever they might meet with (the emperor having mixed among them captains, and even several great men of the court, to keep them in order) the circle in question is thereby reduced to a much smaller one, the diameter thereof not being above three hundred paces. Thus the several beasts which had been comprized in the first circle, are taken by this second, as in a net; for now the life-guards alighting from their horses, keep so very close one to another, that not the smallest outlet is left for any wild beast to escape. They then hunt them so close within these narrow bounds, that the poor creatures being quite spent, come and fall down at the feet of the hunters, and are thus taken with all imaginable ease. Some days they will take two or three hundred hares, besides a prodigious number of wolves and foxes.

Among the many tricks and feats performed by these people, I shall only mention those which seem most uncommon. The roof of the room where the jugglers perform is supported by wooden pillars. One of them took a gimlet, with which he bored one of the pillars, and asked, whether we chose white or red

wine? The question being answered, he pulled out the gimlet, and put a quill in the hole, thro' which ran, as from a cask, the wine demanded. After the same manner he extracted several sorts of liquors, all which I had the curiosity to taste, and found them good of their kinds. Another of these expert youths took three long sharp-pointed knives, and, throwing them up by turns, kept one always in each hand, and the third in the air. This he continued to perform for a considerable time, catching constantly the falling knife by the handle, without ever allowing it to touch the floor. The knives were exceeding sharp, so that, had he missed laying hold of the handles, he must infallibly have lost some of his fingers. The same person took a wooden ball, somewhat less than those commonly used in bowling-greens, with a hole through the middle of it, and a rod two foot long, about the size of a walking-staff, pointed at the extremity, to fit the hole in the ball. He then tossed the ball about a yard high, and caught it again upon the point of the rod, not in the hole of the ball, but wherever it happened to meet the point: And, in this manner, he continued to throw up and catch the ball for a considerable time. He then placed the ball upon the point of the rod, taking no notice of the hole, and twirled it about like a top, so quickly, that the motion could not be observed. This seemed extremely dexterous, for, all the while, he played with the ball in appearance, and when the motion began to slacken, gave it a fresh twirl with his hand, as if the rod and ball had been fastened to each other. There were placed erect, upon the pavement of the room, two bamboos. The length of them was about twenty five feet; at the lower end I reckon them to be near five inches diameter, and at the top, about the breadth of a crown piece. They

were straight, light, and smooth; and each supported by two men. Two boys then climbed up the poles without the least assistance; and having reached the top, stood upright, sometimes on one foot and sometimes on the other, and then upon their heads. This being done, they laid one hand on the top of the pole, and stretched out their bodies almost at right angles to it. In this posture they continued for a considerable time, and even shifted hands. I observed that much depended on the men who held the poles; one of the two at each pole having it fixed to his girdle; and they kept a steady eye on the motion of the boys.

One day in the street I saw a juggler diverting a crowd with a number of tricks: he took an handful of small pieces of copper, with holes in the middle of them, and laid them on a table; he then thrust them into his nostril, one by one with his finger; and this he continued to perform till the whole was exhausted. After this, he suspended an iron chain, of round links, about four feet long; then he took a mouse out of a box, and made it dance upon the table, quite loose. Then the mouse, at his order, went in at one link of the chain, and out at another, till it ascended to the top; from whence it came down again, the contrary way, without missing so much as one single ring. I am fully persuaded, that in tricks, and feats of dexterity, few nations can equal, and none excel, the Chinese.

Of the Grandeur of the CHINESE in their TRAVELLING; their TRIUMPHAL ARCHES, TOWERS, &c.

IT is almost impossible to describe the prodigious grandeur of the emperor and his court, together with the magnificence of the Mandarines; one cannot but be amazed to see nothing but silks, China-ware, furniture, and cabinets, which though not more rich, yet strike the eyes more than things of the same sort do in Europe: But it is not in this that the principal magnificence of the Chinese nobility consists, for they commonly neglect themselves at home, and the laws banish luxury and pomp from thence; it is only allowed when they are seen in public, when they make or receive visits, or when they appear before the emperor.

To say the truth, the horses are not very beautiful, but their harness is magnificent, the bits and the stirrups being either silver or gilt; the saddle is very rich, the reins of the bridle are made of stitched sattin two fingers broad; from the upper part of the chest hang two large tufts of fine red hair, the same as that with which their caps are covered; these tufts are suspended by iron rings either gilt or silvered: They are always preceded and followed by a great number of horsemen, who make their retinue, without reckoning their domestics, who, according to the quality of their masters, are cloathed in black sattin, or dyed callicoe.

But the Chinese magnificence is in the highest splendor at the time the emperor gives audience to ambassadors, when sitting upon his throne he beholds at his

feet the great lords of the court, and all the chief Mandarines in their solemn robes, paying him homage. It is a spectacle truly august to see a prodigious number of soldiers under arms, and an inconceivable multitude of Mandarines habited according to their rank and precedence in exact order, with the ministers of state, the heads of the supreme courts, the reguloes and princes of the blood: all this performed with a great deal of pomp and splendor, gives the highest notion of the sovereign to whom such profound reverence is paid. There is no dispute about precedence, every one knows his place very distinctly; the name of every office is engraved on copper-plates fastened into the marble pavement.

People in Europe are not fond of pomp when they go a journey, but on the contrary are very negligent and careless about it; but they have a contrary method in China, where a chief Mandarin never travels but with pomp and splendor: If he goes by water his own bark is superb, and he has a large train of other barks to carry his attendants: If he travels by land, besides the domestics and soldiers which precede and follow him with spears and ensigns, he has for his own person a litter, a chair carried by mules, or eight men, and several led horses; he makes use of these vehicles one after another, as occasion and the different weather require. There is commonly in every province a great river, or broad canal, with causeways on each side cased with flat stones or marble that serves for a highway: That which is called the great canal crosses the whole empire from Canton to Peking, and nothing can be more commodious for the passing six hundred leagues from the capital to Macao, without travelling by land but one day's journey, in order to cross the mountain of Mei lin, that separates the province of

Kiang si from Quang tong, and even this may be avoided by continuing the journey by water, especially when the waters are high.

For this reason the Mandarines go to take possession of their government, and the messengers sent from court most commonly pass by water: They are furnished with barks at the emperor's expence, which are equal in bigness to a third-rate man of war: There are three different sorts of these imperial barks, than which nothing can be more neat, being painted, gilt, and embellished with dragons, and japanned both within and without: Those of the middle size are most in use, which are above sixteen foot broad, and twenty-four long, and nine in depth from the deck; the form is square and flat, except the fore-part, which is somewhat round.

Besides the cabbin of the master of the bark, who has his family, his kitchen, two large rooms, one before and the other behind, there is a hall about six or seven foot high, and eleven broad, and likewise an antichamber, and two or three other rooms, and a by-place without ornaments, all upon the same deck, which make up the Mandarin's apartment. It is all japanned with fine red and white japan, there is also plenty of carved work, paintings, and gildings upon the cieling, and on the sides; the tables and chairs are japanned with red and black; the hall has windows on each side, which may be taken away when it is convenient: Instead of glass they make use of thin oyster-shells, or fine stuffs done over with shining wax, and enriched with flowers, trees, and variety of figures: The deck is surrounded with galleries, by which the sailors may pass and repass without incommoding the passengers.

This apartment is covered with a sort of plat-form

or terrafs open on all fides, fet apart for mufic, and contains four or five muficians, who make an harmony which can ravifh none but the ears of a Chinefe. Underneath is the hold divided into feveral partitions that contain the baggage; the fails are made of matts, every fail is divided into feveral oblong fquares, which being extended from the fail, when it is folded it takes up little or no room. Thefe fails are very convenient, becaufe they hold more wind than others, and if a ftrong wind breaks the braces no inconvenience arifes from thence to the bark.

To force on the great barks they make ufe of long thick poles in the fhape of a gibbet, or the letter T, one end of which goes to the bottom of the water, and the other is applied to the upper part of the cheft, that the failor may make a ftronger thruft, and force the bark forward with greater fwiftnefs; or elfe they make ufe of oars of feveral fshapes, commonly a long pole with a broad end, and a hole in the middle to receive the pegs that are fixed on the fide of the bark: there are others that are never taken out of the water; they manage the extremity of the oar by moving it to the right and left, that it imitates the motion of a fifh's tail, and is kept in the fame pofition as the tails of birds of prey, when they fly without ftriving their wings.

The convenience of this is that their oars take up little or no room in the bark, for they are ranged on the fide upon planks, and move like a rudder; they feldom are broken, and though they are never taken out of the water they constantly force the bark forward.

There are barks which are drawn along with ropes when the winds are contrary, or when they are obliged to go againft the fream; thefe ropes are made in

many places of the splinters of canes; they cleave the canes into small long splinters, and by that means make them into cords, which never grow rotten by the water, but are exceeding strong; in some other places they make use of cords made of hemp.

The bark that carries the great Mandarin is always followed by several others, as we have already said, among which there is always one at least that bears the provisions; it carries the kitchen, the eatables, and the cooks; another is full of soldiers, a third, much more small and light, is appointed to go before to give notice that all things necessary may be prepared in the passage, that there may be no occasion to wait; these barks have their rowers, and in case of necessity are also drawn with a rope along the bank by a certain number of men that are supplied by the Mandarines of each city, and are changed every day: The number of these men is determined according to the number of horses appointed by the emperor's patent, viz. Three men for every horse, insomuch that if horses are appointed for an envoy, they will supply him with twenty-four men to draw the bark, when the passage is by water; there are at the distance of every league a sort of centries placed at proper distances, so that if there be occasion they may give mutual notice to each other by signals: In the day-time these signals are made by means of a thick smoke, which they cause by burning leaves and branches of pine in three small stoves of the figure of a pyramid, and open at the top: In the night-time they are made by the report of a small piece of artillery. The soldiers at every station, which are sometimes ten, sometimes five, or less according to the place, stand all of a row along the bank out of respect to the Mandarin; one of them bears an ensign

displayed, the others are in the posture that the arms they carry require them to be in.

If it be an envoy they put at the head and stern of the bark four lanthorns, whereon are written in great characters of gold these words, Kin tchai ta gin, that is, The great Envoy from the Court; these words are accompanied with streamers and flags of silk of several colours that play in the wind.

Every time they cast anchor, as they do in the evening, or when they heave it in the morning to pass forward, the Corps de Garde salutes the Mandarin with a discharge of their artillery, to which the trumpets reply with several tantara's: When the night approaches they light the lanthorns at the head and stern, as well as thirteen other lanthorns of a smaller size, which are hung in the form of a string of beads at the side of the mast, viz. ten behind in a perpendicular line, and three above in an horizontal one.

When the lanthorns are lighted the captain of the place stands with his company overagainst the barks, and calls over with a loud voice the men that he has brought to watch, and stand centry all night; then the master of the bark pronounces a set harangue, wherein he makes particular mention of all the accidents that are to be feared, as fire, thieves, &c. and reminds the soldiers that if any of these things happen they shall be responsible for them.

The soldiers at the end of every article give a great shout, after which they withdraw to form a Corps de Garde, and leave one of their company to stand centry, who walks backward and forward upon the key, and continually makes a rattling noise with two pieces of bamboo, that they may not have the least doubt of his vigilance, and that they may be sure he is not asleep: These centries are relieved every hour, and make

the same noise the whole night, according to their turns: If it is a chief Mandarin, or a great court-lord, they pay him the same honours.

The great number of canals that are to be seen in China have something very singular, they are often lined on each side to the length of ten or twelve foot with fine square free-stone, and in some places with grey marble.

Some of the canals have banks that are twenty or twenty-five foot high on each side, insomuch that there is need of a great number of engines to raise the water into the fields: Some are cut above ten leagues in a strait line.

The canal that is on the north-west of the city Hang tcheou is extended very far in a right-line, and is every where more than fifteen toises in breadth; and is lined on each side with free-stone, and bordered with houses as close together as the street of a city, and as full of people: Both the sides of the canal are quite covered with barks; in the places where the bank is low and flooded, they have built flat bridges made of great stones, placed three and three, each of them being seven or eight foot in length in the form of a causeway.

The great canals that are in every province discharge their waters to the right and left into several small ones, that afterwards form a great number of rivulets, which are dispersed in the plains, and reach to the ends of the towns, and often to the great cities; from space to space they are covered with a great number of bridges of three, five, or seven arches; that in the middle is sometimes thirty-six, and even forty-five foot wide, and is very high, that barks may pass through without taking down their masts; those of each side are seldom less

than thirty, and the rest diminish in proportion towards each end of the bridge.

There are some that have but one arch, others have a round vault, others a semicircle; these vaults are built of arched stones five or six foot long, and only five or six inches thick, and some of them are polygons: As these arches are not very thick towards the top, they cannot be strong, but then no waggons pass over them, for the Chinese make use of nothing but porters to carry their bales, who pass over these bridges by the help of stairs on each side, with steps of about three inches thick: There are some of these bridges that instead of arches or vaults have three or four great stones placed on piers in the form of planks, some of these stones are ten, twelve, fifteen and eighteen foot in length; there are a great number of these handsomely built over the great canal, the piers of which are so narrow that the arches seem to be suspended in the air. There is no great difficulty to know in what manner the Chinese workmen build these bridges, for after having finished the arches that are next to the land, when the bridge is to have only one principal arch, or raised a causeway of piers when it is to have several, they then make choice of stones of four or five foot long, and half a foot broad, which they place alternately upright and cross-ways, in such a manner as to contrive that the key-stones shall be laid horizontally. The top of the arch is commonly no more than the thickness of one of these stones, and because the bridges, especially when they have but one arch, are sometimes forty or fifty foot wide between the piers, and consequently are raised very high, and much above the causeway, they ascend on each side by steps of very easy ascent: There are some that it would be difficult for horses to pass

over, and the whole work is generally well contrived.

Among the great number of bridges there are some of a very handsome structure; that which is two leagues and a half westward from Peking, part of which was thrown down by a sudden inundation, was one of the finest that ever was seen; it was made intirely of white marble, well worked, and ingeniously built; there were seventy small pillars placed on each side, which pillars were separated by cartouches of fine marble, whereon were curiously carved flowers, foliage, birds, and several sorts of animals; at the entrance of the bridge on the east-end there were two marble pedestals placed on each side, on which were two lions of extraordinary magnitude; there were also carved in stone several little lions, some going up to the great ones, others descending from them, and others between their legs; at the other end, towards the west, were two other marble pedestals, on which stood the figures of two children carved with the same ingenuity. We ought to place in the rank of public works the monuments which the Chinese have erected almost in every city to perpetuate the memory of their heroes, that is to say, the captains, generals of the army, princes, philosophers, and Mandarines, who have done service to the public, and have signalized themselves by heroic actions.

There is, for instance, near the city of Nan hiong, in the province of Quang tong, an high mountain from whence proceed two rivers; heretofore it was inaccessible, and a Calao born in the province undertook to cut a passage through it for the sake of travellers; to preserve the memory of so signal a benefit they erected a monument on the top of the mountain, and placed his statue there, before which they burnt perfumes

with intent to eternize the memory of this great man, who executed so difficult an undertaking for the use of his countrymen. They reckon more than one thousand one hundred monuments erected to the honour of their princes, and to men whom science or virtue had rendered illustrious: The women have their share in this honour, and they have distinguished several who deserved and obtained the like titles of honour, and whose heroic virtues are constantly celebrated in the works of their most famous poets.

These monuments consist particularly in triumphal arches, which are very numerous in every city; there are many very inartificially made, and deserve little notice, but others worthy of our attention; some are made entirely of wood, except the pedestals, which are of marble.

Those that are at Ning po have generally three gates, a large one in the middle, and two small ones on the sides; the pillars, consisting of one stone, make the door-posts; the entablature is composed of three or four faces generally without projection, and without any moulding, except the last or the last but one, which is in the room of a frieze, and on which they engrave an inscription.

Instead of a cornice there is a roof that serves to compleat the gate, and which is supported by the door-posts; there is nothing but a drawing that can justly represent this kind of roof, even our Gothic architecture has not any thing so odd; every gate is made in the same manner, only every part proportionably less: All these pieces, though of stone, are joined together by tenons and mortises, as if they were made of wood.

The rails or breastwork of the bridges, that are in great numbers on the canals, are made in the same

taste; they are great square flat pieces of stone made to slide in grooves, which are cut in the posts for that purpose.

Upon these triumphal arches, which are seldom above twenty or twenty-five foot high, one may see the figures of men, grotesque figures, flowers, birds jutting out, and other ornaments indifferently well carved; they jut out so much as to be almost separated from the work.

In speaking of the walls and the gates of Peking, I have already given a notion of the Chinese magnificence and public works; I shall only add, that the walls of the cities are erected so high that they hide the prospect of the buildings, and are so broad that one may ride on horseback upon them: The walls of Peking are made of brick, and are forty foot high; they are flanked at each distance of twenty toises with small square towers kept in good repair; there are great stair-cases in some places for the cavalry to ride up upon.

As for the gates, though they are not adorned with figures in Basso Relievo like other public works, they surprize very much by the prodigious height of the two pavilions that form them, by their vaults or arches that in some places are of marble, by their thickness, and by the strength of the work.

The towers erected in almost every city are not the least ornaments belonging to them; they consist of several stories, and the higher they are the less is the circumference; there are windows on all sides of every story: That in the city of Nanking, in the province of Kiang nan, is the most famous, and is generally called The Great Tower, or the Tower of Porcelane; I have already spoken of it in the beginning of this work, but as F. le Compte has given a more exact de-

scription of it, it deserves to be mentioned in this place.

“ There is, says the father, without the city, and
 “ not within it, as some have said, a temple called by
 “ the Chinese The Temple of Gratitude, built by the
 “ emperor Yong lo; it is erected on a pile of bricks,
 “ surrounded with rails of unpolished marble, you go
 “ up to it by a stair-case of ten or twelve steps; the
 “ hall, which serves for the temple, is a hundred foot
 “ high, and is supported by a small marble basis of a
 “ foot in height, which juts out two foot from the rest
 “ of the wall all round; the front is adorned with a
 “ gallery and several pillars; the roofs, for according
 “ to the custom of China there are often two, one that
 “ joins to the wall, and the other that covers the
 “ whole; the roofs, I say, are of green shining japan-
 “ ned tiles; the joiner’s work on the inside is paint-
 “ ed, and adorned with a great number of pieces in-
 “ differently united one to another, which the Chi-
 “ nese think no mean ornament; it is true that this
 “ forest of beams, joists, rafters, and spars, that is seen
 “ in every part, has something very singular and sur-
 “ prising, because one conceives that there is in these
 “ sorts of works a great deal of labour and expence,
 “ though in reality this confusion proceeds from the
 “ ignorance of the workmen, who have not discovered
 “ that beautiful simplicity which is to be seen in Eu-
 “ ropean buildings.

“ The hall receives no light but through the doors;
 “ on the east side there are three very large ones,
 “ through which one enters the famous tower I am
 “ speaking of, and which makes part of the temple:
 “ This tower is of an octagon figure, about forty
 “ foot wide, so that every side is about fifteen foot;
 “ it is encompassed on the outside by a wall of the

“ same figure, two toises and a half distant from the
 “ edifice, and supports at a moderate height a roof
 “ covered with japanned tiles, that seems to proceed
 “ from the body of the tower, which forms under it
 “ a very handsome gallery: The tower has nine sto-
 “ ries, every one of which is adorned with a cornice
 “ three foot from the windows, and surrounded with
 “ the same sort of roof as the gallery, except that it
 “ does not jut out so far, because it is not supported
 “ with a second wall; they become still smaller as the
 “ tower rises higher, and has less circumference.

“ The wall on the ground-floor is at least twelve
 “ foot thick and eight and a half high: it is cased
 “ with China-wate, but the rain and the dust have di-
 “ minished its beauty, though it still looks handsome
 “ enough to shew the nature of the porcelane, though
 “ coarsely made, for it is not to be supposed that bricks
 “ would have preserved their beauty three hundred
 “ years as this has done.

“ The stair-case which is in the inside is small and
 “ inconvenient, because the steps are extremely high;
 “ every story is separated by thick beams placed cross-
 “ ways, which support a floor, and form a room the
 “ cieling of which is adorned with variety of paint-
 “ ings; the walls of all the higher stories are full of
 “ small niches with idols in Basso Relievo; the whole
 “ work is gilded, and seems to be marble or polished
 “ stone, but I believe it to be nothing in reality, but
 “ a kind of a brick made in a mould, for the Chinese
 “ are very ingenious in stamping all sorts of ornaments
 “ on their bricks, which are made of earth extremely
 “ fine and well tempered, and much more capable
 “ than ours of taking the impression of the mould.

“ The first story is the highest, but the rest are all
 “ of the same height; I reckoned ninety steps of a-

“bout ten inches each, which I measured exactly,
 “and which makes an hundred and fifty eight foot;
 “if to this be added the height of the pile, and the
 “ninth story which has no steps, and the roof, it will
 “be found that the tower is from the ground above
 “two hundred foot.

“The top of all the work is not one of the least
 “beauties of the tower; it is a thick pole that stands
 “upon the floor of the eighth story, and reaches more
 “than thirty foot above the roof; it seems to be wrapt
 “in a large iron hoop of the same height, in the fa-
 “shion of a spiral line or screw, several foot distant
 “from the pole, so that it looks like a sort of an emp-
 “ty cone hanging in the air, with spaces to let in
 “light; on the top of it is placed a golden ball of an
 “extraordinary magnitude.” This is called by the
 Chinese The Porcelane Tower, though some Europe-
 ans have called it The Brick Tower; but let that be as
 it will, it is certainly the most solid, remarkable and
 magnificent work in the east.

In taking notice of the public buildings, wherein
 the Chinese have caused their profusion to appear, their
 temples or pagods ought not to be omitted, of which
 there is a prodigious number in China, and the most
 celebrated are built in the mountains; however dry
 these mountains appear, the Chinese industry has made
 amends with embellishments for the conveniences re-
 fused by nature; the canals, cut at great expence, con-
 duct the water from the mountains into basons and re-
 servoirs appointed for that purpose; the gardens,
 groves, and grottos, contrived in the rocks for a shel-
 ter against the excessive heat of a burning climate, ren-
 der these solitudes most agreeably charming.

The buildings consist of porticoes paved with large
 square polished stones, in halls and pavilions that stand

in the corners of courts, and communicate by long galleries adorned with statues of stone, and sometimes of brass; the roofs of these buildings shine on account of the beauty of the tiles japanned with green and yellow, and enriched at the extremities with dragons jutting out of the same colour.

There are few of these pagods that have not a great tower, which stands by itself terminating in a dome, and persons go to the top by a stair-case that winds round about it; in the middle of the dome is commonly a temple of a square figure, the vault is often adorned with Mosaick work, and the walls with stone figures in Relievo, which represent various animals and monsters.

Such is the form of the greatest part of the pagods, which are more or less large according to the devotion and riches of those who have contributed to build them: These are the abodes of the bonzes and idol-priests, who make use of a thousand arts to impose upon the credulity of mankind, who come from a great distance in pilgrimage to these temples consecrated to the devil; but as the Chinese are not very consistent in the worship they pay to their idols, it often happens that they have little veneration either for their gods or their ministers.



*Of the RIVERS, LAKES, and VOLCANOES in
CHINA.*

THE rivers of China are no less considerable than its canals, there are two especially, which the relations have made famous. The first is called Kiam or Yamce, which they commonly translate The Son of the Sea: But I am afraid they are mistaken; for the letter the Chinese use to write Yam is different from that which signifies the sea, although the sound and pronunciation may have some affinity: Amongst several significations that this letter may have, that which they gave it in former times makes for our purpose. Under the reign of the emperor Yon it signified a province of China, limited by this river on the north; and it is somewhat probable that they gave this same name to the river, because that prince drained all the water that overflowed the whole country.

This river takes its rise in the province of Yunnan, crosses the provinces of Soutchouen, Houquam, and Nanking; and after it hath watered four kingdoms far and wide for four hundred leagues together, it disembogues into the east-sea over against the isle of Tçoum-mim, cast up at its mouth by the sands which it carries along it; The Chinese have a proverb amongst them that says, The sea hath no bounds, and Kiam hath no bottom. And in truth in some places there is none to be found; in others they pretend there is two or three hundred fathom water. I am nevertheless persuaded that their pilots, that carry not above fifty or sixty fathom cord at longest, never had the curiosity to sound so deep as three hundred fathom; and

the impossibility of finding the bottom with their ordinary plummet, is sufficient, in my opinion, to incline them to such hyperboles.

I have many times sailed upon this river; I have moreover taken a diligent account of its course and breadth from Nanking, to the mouth of another river, into which men enter to pursue the way to Canton. It is off of Nanking thirty leagues from the sea, a little half league broad; the passage along it is become dangerous; and becomes more and more infamous every day for its shipwrecks. In its course, which is exceeding rapid, it forms a great number of isles, all of them very beneficial to the province, by reason of that multitude of bull-rushes ten or twelve foot high that it produceth, serving for fuel to all the cities thereabout; for they have scarce wood enough for buildings and ships. They yield a great revenue, and the emperor draws considerable duties from them.

The river which the torrents of the mountains do sometimes swell extraordinarily, grow so rapid, that many times they bear away the isles with them, or lessen them by the half; and for the same reason form other new ones in some other place; and one cannot but admire to see them change place in such a short time, just as if by diving, they had past under water from one place to another; that does not always come to pass: But there is observed such considerable change every year, that the Mandarines, lest they should be mistaken, get them to be measured every three years, to augment, or diminish the imposts and duties, according to the condition they are found in.

The second river of China is called Hoamho, as much as to say, The yellow River, because the earth it sweeps away with it, especially in times of great rains, give it that colour. I have seen a great many

others, whose waters at certain seasons of the year, are so overcharged with slime, and so gross and thick, that they rather resemble torrents of mud, than real rivers. The Hoamho takes its source at the extremity of the mountains that bound the province of Soutchouen in the west: From thence it throws itself into Tartary, where it flows for some time all along the great wall, at which it re-enters China between the province of Chanfi and Chenfi. After that it waters the province of Honan; and when it hath run cross one part of the province of Nanking, and flowed above six hundred leagues into the land, it disembogues at length into the east sea, not far from the mouth of Kiam. I have crost it, and coasted it in divers places; it is every where very broad and rapid, yet neither deep nor navigable, to speak of.

This river hath in former times caused great desolation in China, and they are still forced at this very day to keep up the waters in certain places by long and strong banks, which notwithstanding does not exempt the cities thereabouts from apprehensions of inundation. So likewise have they been careful, in the province of Honan, the ground lying very low thereabout, to surround the greatest part of the cities, about a mile from the walls, with a terrace, cased with turf, to prevent being surpris'd by accidents and casualties in case the bank be broken, as happened about fifty-two years ago. For the emperor, endeavouring to force a rebel (who, for a long time laid close siege to the city of Honan) to draw off, caused one part of the banks to be broken down, thereby to drown the adverse army. But the relief he afforded the city proved more fatal than the fury of the besiegers would have been; the whole province almost was laid under water, together with many cities and abundance of

villages, above three hundred thousand persons drowned in the metropolis, amongst whom were some of the missionaries, who at that time had a numerous flock of Christians; there they and their church lost their lives.

The low country ever since is become a kind of a marsh or lake; not but that they have some design to repair this loss, but the undertaking is difficult and very expensive. The sovereign court that takes care of public works, importuned the emperor more than once to send father Verbiest thither, and probably that prince would have consented thereto at last, but he discovered that the Mandarines made use of this pretence, to remove the father a distance from the court, and that their design was to engage him in a difficult enterprize, that was enough to destroy him; or out of which he could never have disentangled himself with any honour.

There is to be seen in China abundance of other rivers less famous, but yet more commodious for commerce and trade.

As to what concerns fountains it were to be wished there were more of them, and better. It is certain that their usual waters are not good, which, perhaps, hath obliged the inhabitants, especially in the southern provinces, to drink it always warm.

We are assured that there are to be found in China amongst fountains, several that suffer flux and reflux as regularly as the sea doth, whether it be that they have some communication with the ocean by certain subterraneous conveyances, and conduits, or whether it be in passing through certain earths, they are impregnated with salts and spirits apt to cause this fermentation, I leave others to determine.

Since I have begun to speak of the different waters

of China, I cannot pass over in silence the lakes and ponds that are every where almost to be seen in all the provinces. Those that are produced in winter by the torrents from the mountains, lay waste the fields, and render the whole country during summer, barren, sandy, and full of flints. Those that arise from springs are abounding in fish, and yield a considerable revenue to the emperor by the salt they afford. There is one of them amongst the rest, if I be not mistaken, it is in Chan si, in the middle whereof appears a small island, where people divert themselves, during the excessive heat, to sprinkle water all over. There is made in a little while, a crust of a certain salt very white, and of a pleasant scent, which they continue all the summer long, with that success, that the salt would be sufficient for the whole province, if it were as salt as that of the sea; they commonly make use of it to season meat withal.

Although I have not seen all these famous lakes in China, whereunto historians ascribe so many miracles, yet shall I relate something, which I do not care to warrant for gospel; which, nevertheless, will let you understand the genius of the country, where people so easily give credit to what is most incredible.

In the province of Fokien there is one whose water is green, and changes iron into copper. They have built a palace upon the banks of another not far distant from the former, in an apartment of which one hears the ringing of bells every time heaven threatens a storm. There are waters in the province of Canton that change colour every year, in summer and in winter, they are very clear; in autumn they turn blue, and of such a fine blue that people make use of it to dye stuffs.

In that place is to be seen a mountainfull of caverns,

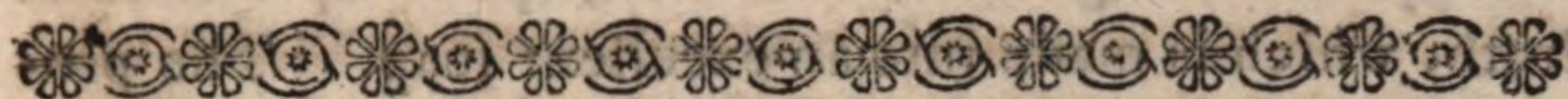
whose very aspect is very terrible, in which is found a lake of that nature, that if one throw a stone into it, one may hear a noise like thunder; some time after there ariseth a gross mist, which immediately dissolves into water.

But the most famous of them all, is, that of the province of Jannan. The Chinese would make you believe that this lake came all on the sudden, during an earthquake that swallowed up all the country with its inhabitants: This was a just judgment upon them for their wickedness, for they were very dissolute livers. Of all that were there at that time, there was but one child that was saved, which they found in the middle of the lake born up upon a piece of wood.

In the isle of Hainan, belonging to China, there is a sort of water, whether it be a lake or fountain, I know not, that petrifies fish. I myself have brought over crawfish, that preserving their intire natural figure, are so far changed into stone, that the claws and body of them are very hard, very solid, and little differing from stone.

The lake Tong ting hou is the largest in the empire, which is an extraordinary thing, for in almost every province there is a lake of prodigious extent. This in particular is formed by the confluence of four large rivers, which come from the province of Kiang si; it is thirty leagues in circumference.

There are several volcanoes or burning mountains in China, the most remarkable whereof is that called Linosing, which is of a great height, and vomits fire, cinders, ashes, and sometimes torrents of sulphur and other minerals.



*Of the FOSSILS, BEASTS, BIRDS, and FISHES, in
CHINA.*

THE mountains of China abound with variety of metals and minerals, and amongst the rest they have gold and silver, but their gold mines are not suffered to be opened, and yet they have plenty of that commodity, by reason of the great quantities of it washed down by torrents from the mountains in the rainy seasons, and caught by fleeces and other strainers laid across the water, or found among the sand and mud of their rivers. Multitudes of people live wholly by this business of gathering gold, which is said to be so pure as to need no refining. It is probable they prohibit the working of their gold mines, that they may have a reserve of that metal in case of need, having at present more than enough for their own use, and a constant supply brought into their country from Europe and other parts. They have also mines of copper, iron, quick-silver, and some lead: but this last metal is very scarce, as appears by our English lead finding so quick a market in China. Besides these metals they have several compound ones, the manner of mixing which they keep as a great secret; particularly that called tonbaga or donbaga, which is of the colour of very pale brass, or a dull kind of tin, and to which they ascribe several extraordinary virtues, as those of expelling poison, stopping hæmorrhages, and the like, merely by wearing it in the form of a ring or necklace.

In several parts of the province of Honan in China, there is found a sort of salt-earth, which being boiled and crystallized makes a very good white salt; and in

some places the ground, after rain, spews up a kind of froth, which is made into an excellent soap. The province of Quangsi is famed for a yellow earth, which taken inwardly expels poison, and by outward application cures the bite of venomous creatures. There is also a sort of earth of a fine red like vermilion, and another of a fine white, which are used as cosmetics by the ladies. The same province furnishes in great abundance that valuable earth or clay of which they make their porcelane or China-ware, so much esteemed and used amongst us, being the most beautiful earthen manufacture of any in the world, though it has of late been well imitated in Europe. This earth is of two kinds, the one called kaulin, which is full of glittering corpuscles; the other called petunse, which is of a plain white, exceeding fine and soft to the touch. Both those earths, or rather stones, are found in quarries twenty or thirty leagues from Kingteching, to which place they are brought down the river by a vast number of little barks continually employed in that service. The petunse is cut out of the mine in form of bricks, and is much harder than the kaulin, which last notwithstanding is what gives the strength and firmness to the porcelane. The mines of the kaulin are deep, wherein it lies in glebes or clods; and the mountains whence it is dug are covered with a reddish earth.

The Chinese have a stone called Hiang hoang, which they imagine to be an antidote against every kind of poison; in some places there are large quarries of it. It is of a soft substance, and cups, and such-like things are easily made of it. It is naturally of a yellowish colour, and sometimes spotted with black.

Lapis Lazuli is found in several places near Yun

nan, and is not very dear, it differing in nothing from that which is imported into Europe.

Yu che, of the finest sort, is generated in the district of Tai tong fou, of the province of Chanfi: It is a species of jasper, of the colour of the white part of agate. It appears transparent, and sometimes spotted when it is polished.

The rubies which are sold at Yun nan fou, are of the right kind, but very little. There are also other precious stones to be had there; but they are to be imported from other countries, and especially from the kingdom of Aca.

In the province of Fo kien the finest rock-chrystal is to be found. The artificers who live near the mountains where it is got, are very skilful in working it; and they make seals, buttons, figures of animals, &c. of it.

Quarries of fine marble, which would equal the best in Europe, if it were well polished, are to be seen in this province; but they make not much use of it in their public buildings.

There are in China a prodigious number of all kinds of wild beasts, such as tygers, boars, buffaloes, rhinoceroses, camels, &c. but no lions; but as these beasts are universally known, I shall only take notice of those peculiar to this country.

There is a species of camel no higher than an ordinary horse; these have two bunches upon their back covered with long hair, which form a kind of a saddle; the bunch before seems to be formed by the back-bone and the upper-part of the shoulder-bone, and is not unlike the bunch which the Indian cows have on their shoulders; the other bunch is placed just before the buttocks. This animal has not such long legs in proportion as the common camels; they have also a shor-

ter and thicker neck, covered with thick hair as long as that of goats; some of them are a yellowish dun colour, others are a little upon the red, and of an ash-colour in some places; the legs are not slender as those of the common camels, insomuch that this kind of camel or dromedary seems for its largeness more fit to carry burdens.

There is an animal somewhat resembling a roe-buck, which the Chinese call Kiang tchang tse, that is, the musk roe-buck: these deer are found in the mountains near the city of Peking. They have no horns, and their hair is of a blackish colour. The musk bag is composed of a very thin skin, covered with extremely fine hair. The flesh is good to eat, and is frequently served up at the best tables. The musk is generated in the inward part of the bag, and sticks all round it like a kind of salt. There are two sorts, but that which is in grains is the most valuable, the other is the least esteemed, because it is too small: the female produces no musk, or if she does it has not the least scent.

It is said that this animal feeds on the flesh of serpents, and that the roe-buck easily kills them, because when they are at a certain distance from the roe-buck they are overcome with the scent of the musk, and grow so weak that they are not able to stir.

When the country people go to cut wood or make charcoal in the mountains, they have no better secret to guard them against serpents, whose bite is very dangerous, than to carry about them a few grains of musk: then they sleep peaceably after they have dined, and if any serpent comes near them, it is suddenly stupified by the smell of the musk, and is able to get no farther.

There are all kinds of parrots in the southern provinces, exactly resembling those brought from Ameri-

ca. They have the same plumage, and the same aptness for talking: but they are not to be compared to the bird called Kni ki, that is, the Golden Hen. There is no such species to be found in Europe. The liveliness of the yellow and red, the plume on the head, the delicate shadowing of the tail, the variety of colours in the wings, together with a well-shaped body, have doubtless given occasion for the epithet of Golden conferred on this fowl, to shew its preference over the most valuable of the winged race. The flesh of it is also more delicate than that of a pheasant, so that, on every account, not one of the eastern birds can be more desirable than this in Europe.

The Hai t'ing may also be reckoned among the beautiful birds. It is very uncommon, and is to be found only in the district of Han t'chong fou, in the province of Chenfi, and in some parts of Tartary. It is as beautiful as our finest falcons, and is far superior in size and strength; so that it may be called the king of the birds of prey in China and Tartary.

Besides the domestick birds, they have on the rivers and lakes great plenty of water-fowl, and especially wild-ducks: the manner of taking which has been already described in p. 110 of this volume.

The butterflies of the mountain Lo feou chan are also greatly admired. It is situated in the district of Hoei t'cheou fou, of the province of Quantong. The most curious and largest among them are sent to court, where they are made use of for a particular kind of ornament. Their colours are very lively, and beautifully diversified. These butterflies are larger than the European ones. They lie motionless on the trees in the day-time, and consequently are easily taken; but in the night they flutter about much like our bats, and several of them appear to be very near as large. There

are others of a less kind, much sought after, but not half so beautiful as these.

There are no species of fish in Europe but what are to be found in China; they have sturgeons, carp, soals, lampreys, shad, trouts, salmon, &c. and also several others of a delicious taste, which are quite unknown in Europe. The most remarkable are the following.

Tcho kia yu, or the armour-fish, is greatly esteemed by them, and weighs near forty pound; the reason of its being called so is, because it is covered with very sharp scales, placed in right lines one over another, like tiles on the roof of a house; it is very white within, and greatly resembles veal in taste.

They catch another delicate fish in calm weather, which the natives call the meal-fish, on account of its extraordinary whiteness, and because the black pupils of its eyes are surrounded with two circles resembling bright silver: they are to be found in the sea near the province of Cang nan, and in such prodigious shoals that with one draught of the net they commonly catch four hundred weight of them.

One of the best fishes in China is that which is caught in the fourth and fifth moon; it resembles a sea-bream, and weighs five or six pound; it may frequently be bought for little more than a farthing a pound, and for as much more twenty leagues up the country where it is carried.

When this sort of fishing is ended, there come from the coasts of Tche kiang large barks, loaded with another kind of fresh fish like a cod; it can hardly be imagined how much there is consumed of them in the proper season from the coasts of Fo kien to Chang tong, besides the immense quantity which are salted in the country where they catch them.

They may be bought very cheap, though the mer-

chants are at a great expence in transporting them, for they must get leave of the Mandarin to trade, then they must hire a bark, buy the fish as soon as they are caught, and place them in the hold on layers of salt, in the same manner as they pack up herrings at Dieppe; by this means, notwithstanding the extraordinary heats, the fish is transported into the most distant provinces. One may easily imagine how plentiful this fishery must be, since they are sold so cheap, notwithstanding the charge that the merchant is at. There is also an amazing quantity of other salt-fish brought from the sea-coast: In the province of Kiang nan one meets with very large fish, brought from the sea, or the Yellow River, which throw themselves upon large meadows quite under water, but managed with so ingenious a contrivance that the water runs off as soon as they are entered, so that the fish being left on dry land, are easily taken; then they salt them, and sell them to the merchants, who load their vessels at a cheap rate.

In the great river Yang tse kiang, opposite to the city Kieou kong, where it is about a league and a half broad, they catch every kind of excellent fish, and among the rest one which they call Hoang yu or the Yellow fish: it is very large, and of an exquisite taste, and some of them weigh eight hundred pound; they eat as firm as any fish, and are not caught but at certain seasons, that is when they come from the lake Tong ting hou into this river.

The Hai feng is hideous and ugly, and is commonly seen floating near the shore in the sea of Chang tong and Fokien. It looks like a shapeless lump of some inanimate matter, and cannot be easily described; the natives affirm it has four eyes and feet. It has neither bones nor prickles, and dies as soon as it is pressed. It may be preserved by a little salt, and by that means

conveyed over the whole empire. It is much used, and reckoned very delicious eating, but a European palate would not like it.

There is a kind of sea-crab which are very subject to petrefaction without losing their natural shape.

The Gold-Fish are generally between three and four inches in length, and proportionably thick; the male is of a beautiful red from the head half way down the body, and the remaining part seems to be gilded, but in such a manner that our best performances of that sort are much inferior to it. The female is white, and has the tail and some part of the body perfectly like silver; the tail of each is not smooth and flat, like that of other fish, but makes a kind of a tuft thick as well as long, and adds new beauty to this little creature, whose body is otherwise well proportioned.

They ought to be very careful who feed them, as they are extremely delicate, and sensible of the least injury from the weather; they are put in a deep large basin, at the bottom of which they frequently put an earthen pan turned upside down, with holes in it, that in the heat of the day they may have a shelter from the sun; they also throw upon the surface of the water a certain kind of herb, which keeps it always green and cool; they change this water twice or thrice a week, but in such a manner that the fresh enters in while the old is going out. If they are obliged to transport the fish from one vessel to another, they are very careful that they do not touch them with their hand, for those which are touched soon die, or are in a languishing condition, therefore they make use of a small net, fastened to a round piece of wood, hollowed in the middle like a circle, with which they gently lift them up, and the threads are so close together that it does not let the water quite out before they

are put into fresh. They are very much hurt, and sometimes killed, by a great noise, like that of guns or thunder, or a violent motion, or strong smell; for I have remarked upon the sea, when we have had some of them with us, that this was the case whenever a gun was fired: besides, they live upon almost nothing; the imperceptible worms that are bred in the water, or other such-like things, are sufficient to support them; notwithstanding which they frequently cast little pieces of paste into the basons, but there is nothing better than wafers, which, being soaked, make a kind of soup, of which they are vastly fond, and which undoubtedly is very proper for them.

They multiply greatly in warm climates, provided they are careful to take away the spawn that swims upon the surface of the water, which they would otherwise entirely devour; they place the spawn in a particular vessel exposed to the sun, and keep it there till the heat hatches the young fry; they are at first quite black, but change by little and little to red or white, with gold or silver, according to the different kind; the gold and silver begin to appear at the end of the tail, and extend by degrees towards the middle of their bodies, according to their particular disposition.

The following observations have been made by a curious traveller, who was intimately acquainted with some of the Chinese who get their livelihood by breeding these fish.

Some of them grow to be as long and as thick as herrings, though the generality of them are no longer than one's longest finger.

The male and female are not distinguished by the red or white colour: the females have small white spots about their gills, and little fins that are near them; and these places in the males are bright and shining.

Though the generality of them have the tail in the shape of a tuft, yet there are several which have them the same as those of other fish.

Besides the little balls of paste which they are fed with, they give them the yolk of a boiled egg, lean pork dried in the sun, and reduced to very fine powder; sometimes they put snails into the vessel where they are kept, because their slime sticks to the sides of the vessel, and is an excellent ragout for these little creatures. They are likewise very fond of small red worms found in the water of some reservoirs.

They do not often multiply when they are shut up in these vessels, because their limits are so small: for if you would have them bred you must put them in reservoirs, where the water is fresh and deep in some places.

You must let the water settle four or five hours which you draw out of the well to fill the vessel where the fish are put, else it would be too raw and unwholesome.

About the beginning of May, when you perceive the fish spawning, you should scatter grass upon the surface of the water, that the spawn may adhere thereto, and when you perceive that the spawning is over, that is when the males forsake the females, the fish must be taken out of the vessel and put into another, that the vessel that has the spawn may be exposed in the sun for three or four days, and the water must be changed in about forty or fifty, because the small fry may then plainly be seen.



The State of PHYSICK *in* CHINA.

THE Chinese have several antient authors who treat of the art of medicine, and since the empire was established they have constantly applied themselves to it.

They are but little skilled in natural philosophy, and are entirely ignorant of anatomy; they were never sensible of the uses of the parts of the human body, nor consequently the causes of distempers, all their knowledge depending upon a doubtful system of the structure of the human frame; we ought not therefore to be surpris'd that they have not made the progress in this science that our European physicians have.

This nation has always greatly esteemed the study of physick, not only because it is useful for the preservation of life, and the recovery of health, but because they imagine there is a close connexion between the celestial motions and it. Formerly there were imperial academies for the improvement of medicine, but the physicians who are now most esteemed, are those who have got their knowledge from their forefathers in the same line.

Two natural principles of life are laid down by the Chinese, viz. vital heat and radical moisture, of which the spirits and the blood are the vehicles. They call the vital heat Yang, and the radical moisture Yn; and as these two names joined make what we call man, which has the name of Gin in their language, it is likewise of the strokes or figures of these two words, joined together, that they form the character or figure of the name of man; and they say, in a symbolical

manner, that as the division and separation of these strokes divide the figure or name of man, so the division of these two principles also kills man.

The Chinese think that the two principles of life are lodged in every principal part of the body, in all the members and intestines, to convey life and strength.

They make three divisions of the body, one is into the right and left parts; each of these parts have an eye, an arm, hand, shoulder, leg, and foot: the second division is into three parts, as the thigh, the middle, and the lowest part; the high includes the head and the parts as far as the breast; the middle reaches from the breast to the navel; and the last from the navel to the soles of the feet.

They likewise add a third distinction to these two, which divides the body into intestines and members.

The six principal members, wherein the radical moisture is lodged, are three on the left side, viz. the heart, spleen, and one of the kidneys; three on the right, the lungs, the liver, and the other kidney, which is by them called the Gate of Life.

The intestines or entrails, in which they place the vital heat, are also six in number; three on the right, the great guts, the stomach, and the third part of the body; three on the left, the small guts, the ureters, and the gall-bladder.

They also believe that there are certain mutual relations between the intestines and the members: Thus they pretend that on the right side the great guts have reference with the lungs, the stomach with the liver, and the third part of the body with the gate of life, or the right kidney; on the left side, the small guts to the heart, the gall-bladder to the spleen, and the ureters to the kidneys.

Such, in their opinion, are the parts of the body

which are the natural seats of vital heat and radical moisture; and it is from these places that they pass into other parts of the body by means of the spirits and blood, the circulation of which it appears they have known ever since about four hundred years after the universal flood.

They also imagine that the body is, by reason of the nerves, muscles, veins, and arteries, a kind of lute or musical instrument, whose parts render different sounds, or rather of a certain kind of temperament proper to themselves by reason of their figure, situation, and various uses; and it is by these means that the different pulses, which are like the various sounds, and diverse touches of these instruments, are marks whereby to judge infallibly of their disposition; in the same manner that a string more or less stretched, touched in one part or in another, in a manner more strong, or more gentle, gives different sounds, and shews if it is too tight or too slack.

These twelve sources of life in the body of man being established, they have next searched after outward tokens in the body, that may discover the inward disposition of these twelve parts, and they really believe they have found them in the head, which is the seat of all the senses that perform the animal operation; and they supposing necessary relations between these senses, and the sources of life, say that there is an agreement between the tongue and the heart, the nostrils and the lungs, the mouth and the spleen, the ears and the kidneys, as also the eyes and the liver; and they imagine that from the colour of the face, eyes, nostrils, and ears, from the sound of the voice, and the disposition of the tongue, they can make certain conjectures of the temperature of the body concerning the death or recovery of a sick person.

Having shewn that they make the heart, the liver, the spleen, the lungs, and the kidneys, the seat of radical moisture, and the six intestines, the seat of the vital heat; I must now explain the manner in which they think this radical moisture and this vital heat are communicated to other parts of the body: They pretend there are twelve ways, or twelve canals by which they are conveyed.

There is a canal, say they, by which the radical moisture passes from the heart to the hands, and they call it Chao chun yn king: It is by such-like passages that the viscera, which are united to the heart, convey the vital heat, and these canals are called Cheu tai yang king: These two organs joined make one of the sources of life.

The spleen sends the radical moisture to the feet, and the canal which it passes is called So kiue yn king; and it is the gall-bladder that conveys the vital heat to it by a passage called So chiao yang king.

The kidneys also send the radical moisture through another passage, as also the ureters the vital heat: These canals preserve the communication of life with the left side of the body.

The lungs convey the radical moisture on the right side by a canal called Cheu tai yn king, and the great guts the vital heat by the passage Cheng yang ming king. The radical moisture goes from the liver to the feet, and the vital heat from the stomach, the one by So yang ming king, and the other by So tai yn king.

The radical moisture goes from the gate of life to the hands, by Cheu kiue yn king; and the vital heat of the third part of the body to the feet, by Cheu chao yang king.

In this manner, say the Chinese, life and vigour are distributed throughout the body, and a man cannot

have the reputation of a learned physician among them, unless he be well acquainted with these six sources of life, which proceed from these twelve origins, and likewise the passages and canals by which they are conveyed, and the alterations that may happen to them.

After this knowledge of the construction of a human body, which is according to the antient anatomy of the Chinese, and is, as plainly appears, not very exact, they then proceed to the knowledge of the exterior bodies, which may produce changes in the body of man.

These bodies, according to them, are the elements, which are five in number, the earth, metals, water, air, and fire: A human body is composed of all these elements, which are disposed in such a manner, that in some parts one element has more power than the rest.

Agreeable to this method, fire reigns in the heart and the chief vicera, which lie near it; and the south is the part of heaven which has the principal reference to these parts, because heat is chiefly situated there, and it is in summer that they observe the affections of the heart.

The liver and the gall-bladder are referred to the element of air, and both have a relation to the east, which is the place from whence winds and vegetation proceed; and the disposition of both these parts ought to be observed in the spring.

The kidneys and ureters belong to the water, and are referred to the north, whence winter is the properest time to observe their indications.

The lungs and great intestines are presided over by the metals, as are the west and the autumn, which is the time of their indications.

The spleen and stomach are of the nature of the earth, and they are referred to the middle of the heavens, between the four cardinal points, and the third month of every season is the time of their particular indications.

The third part of the body and the gate of life are subject to fire and water, and receive the impressions of the heart and kidneys, which they communicate to the other parts.

Their reasoning is much the same as ours with regard to the agreement and disagreement of these elements with the body of man, from whence arise alterations and diseases.

They pretend to discover all the dispositions of these parts by the difference of the pulse; the following are their principles.

The pulse, say they, is caused by motion, and this motion is caused by the flux and reflux of the spirits, which are conveyed by the before-mentioned twelve passages to every part of the body.

Every thing, continue they, that causes motion, thrusts forwards some moveable body, and every thing that is moved either easily gives place, or makes resistance; thus as the blood and spirits are in a perpetual motion, strike against, and press the vessels in which they are conveyed, a beating of the pulse must unavoidably arise.

The knowledge and perfect comprehension of these beatings and percussions discover the disposition of the body, and the affections which they receive from the elements: one knows by these beatings the nature of the blood and spirits, as also what defects and excesses may be found therein, and it is a skilful physician's business to regulate and reduce them to their first temperament.

Two things are to be observed in every motion; the place where it is made, and its duration; the Chinese physicians are therefore obliged to take notice of the places where the pulse may be examined, and the time of its beating.

They seldom practise letting-blood, yet it cannot be denied that they are acquainted with it; the use of glisters has been propagated from the physicians of Macao; they like this remedy well enough, but call it the remedy of Barbarians, because the knowledge of it came from Europe. Their whole science consists in the knowledge of the pulse, and the use of simples, of which they have great variety, and which, according to them, have specifick virtues to cure various diseases.

By the beating of the pulse alone, they pretend to know what is the occasion of the distemper, and in what part of the body it resides. In a word, all the skilful physicians discover or predict pretty exactly all the symptoms of a disease: and it is chiefly this that has gained the Chinese physicians such high renown in the world.

At their first visit of a sick person they lay his arm upon a pillow, then put their four fingers along the artery, sometimes hard and sometimes gently; they take some time to examine the beating, and distinguish the differences how imperceptible soever, and according to the motion more or less quick, full or slender, uniform or irregular, which they observe with the greatest attention, they discover the cause of the disease, in so much that without asking the patient they tell him where the pain lies, whether in the head, the belly, or the stomach; or whether it be the liver or spleen which is affected; they also foretell when his head shall be easier, when he shall recover his stomach, and when he shall be quite rid of the disease.

I speak of experienced physicians, and not of those people who, without either study or experience, profess the art merely for a livelihood. It must be owned, the Chinese physicians have acquired a very amazing knowledge in this matter.

Several instances might be given of this, but one shall suffice: A missionary in the prison of Nanking fell dangerously ill; the Christians, who were afraid of losing their pastor, prevailed upon a physician to visit him: he came to the prison, and after he had considered the patient, and felt his pulse with the usual ceremonies, he immediately made up three medicines, which he ordered him to take, one in the morning, another at mid-day, and the last in the evening.

The next night the sick missionary found himself worse, lost his speech, and they imagined him to be dead; but the following morning there was so great a change, that the physician, having felt his pulse, declared that he was cured, and that he had only to observe a certain regimen till his health was entirely re-established; and accordingly, by observing this method, he was recovered. When some of the physicians visit sick persons, they bring in their chair, or by a servant who follows them, a chest with different drawers, which are separated into about forty small compartments well furnished with simples and roots, which are administered according to the nature of the disease; and they are either sudorific, or serve to purify the blood and humours, to strengthen the stomach, to dispel vapours, and to stop fluxes, or else are gently purgative.

Some of them carry no chest, but give a prescription, and leave the patient at liberty to take them of him, or buy them from the druggists, who have large shops furnished with excellent medicines in every city; some think it would undervalue them to dispense medicines, and these generally have higher fees than the others.

There are also a sort of quacks, who collect several receipts, and who after having examined the distemper pretend to make a cure, and agree for a certain sum, which is not to be paid unless the patient recovers.

But what most enriches the physicians is to cure Mandarines of distinction, or other wealthy people; for, besides what they receive every visit, they have other very valuable rewards.

After the physicians have made use of the simple decoctions, and restored health, they depend greatly upon their cordials entirely to extirpate the disease; they have these of all sorts, which are for the most part composed of herbs, leaves, roots, fruit, and dried seeds.

They have abundance of every kind of simples, which are sold in all the cities of the empire; what one province has not, it borrows from another, and there are fairs where nothing but medicines are sold, and shops filled with nothing but simples.

The Chinese physicians allow their patients to drink water, but it must first be boiled: other food is generally prohibited; and if the patient be extremely hungry they allow him to take but little: their reason for this is, that the body being indisposed, the stomach is not fit to perform its functions, and that the digestion made in this condition is always hurtful.

Their fee for this visit, and for their medicines, is very moderate: they never return after the first visit, unless desired, which gives the patient liberty to employ another, which is frequently the case, when the medicines given by the former do not please them.

The most singular part of the Chinese medicines being the ingenuity of the physicians in judging of distempers by the beating of the pulse, it will undoubtedly be very agreeable to learn in what the secret of the pulse consists.

The following treatise on the secret of the pulse was made, as all the Chinese acknowledge, by Ouang chou ho, who lived under the dynasty of Tsin, that is many hundred years before the Christian æra; but father

Hervieu, an ancient Chinese missionary, who has been at the trouble of translating it from the Chinese language, imagines that it is rather a collection than a treatise made by one and the same author.

It is however certain, that this is the most antient and valuable thing of the kind in all China. There are several omissions of some parts of the text, because they contain nothing but what is elsewhere more plainly expressed, or because they would require long explanations to render them intelligible, which, after all, would not be of the least advantage.

The SECRET of the PULSE.

THE TEXT.

BY examining the pulse is the best method of understanding diseases, and of judging whether they are mortal or not.

The pulse of the left wrist must be consulted when the heart is diseased.

The left hand must also be taken in distempers of the liver; but it must be carefully examined at the joining of the wrist with the bone of the cubitus.

The pulse must be examined a little higher than the joint towards the end of the cubitus, in distempers of the kidneys; for the right kidney the right hand must be taken, and for the left kidney the left hand.

EXPLANATION.

Ming men, the gate of life, is otherwise the name of the right kidney.

REMARK.

The Chinese physicians are mostly of opinion, that the right kidney is the seminal reservoir, and this is the reason of its being called the gate of life. An ancient author explains the origin of this name in a different manner, and says that it is principally the right kidney which converts the blood into the seminal liquor.

THE TEXT.

It is very easy to distinguish the several parts wherein the pulse is to be felt in the distempers of these five different noble parts: but, notwithstanding this, the examination of the pulse is very difficult in some places. The perpetual motion of the circulation, wherein the captain and his train are continually day and night, is in reality determined to a certain number of circulations; but yet there are a thousand differences in the pulse, according to the season, age, stature, and sex.

EXPLANATION.

The blood [Hiué] is the captain, his train are the spirits, [Ki] the blood runs within the vessels, and the spirits without; they are in a constant motion of circulation, and ought to make fifty rounds in the space of a day and night: this is the determinate number taken notice of in the text.

REMARK.

While a person is breathing, that is in the space of an

expirafion and infpiration, the blood and fpirits move forward fix inches, and the pulfe generally beats four times: as in twelve Chinefe hours, which contain a day and a night, they reckon thirteen thoufand five hundred refpirations, it muft move eight hundred and ten Tchang, a meafure containing ten Tché or foot of ten inches each in one day: then the longeft road of the blood and fpirits in a human body is but fixteen Tchang, two foot; and confequently the blood muft make fifty circulations in one day and night. This is taken from a Chinefe book, but not from this that is now tranflated.

Though it is tranflated The perpetual motion of circulation, there is no affiftance given to the expreffion, for the Chinefe words mean the fame thing; whence it feems natural to imagine, that the circulation of the blood fo lately found out in Europe has been known about two thoufand years by the Chinefe. However, I am far from venturing to warrant this conclufion; I do not find that the Chinefe phyficians diftinguifh exactly between veins and arteries, nor the road that the blood takes in flowing from and returning to the heart.

Some of the learned among the Europeans, in tranflating their dictionaries have found words that fignify according to them, nerves, arteries, and veins: but though I have perufed the Chinefe phyfical books, and endeavoured to inform myfelf from living authorities, I do not find that thefe words contain exactly the fame ideas that we have at prefent; and it may be faid, that if China formerly had fuch a knowledge, as certain expreffions induce one to imagine, they have been fome time laid afide.

In tranflating the Chinefe explanation, I have put, His train are the fpirits; none of the various fignifications of the character Ki, was, in my opinion, more a-

greeable to this place: but this character may also signify vapour, humour, air, &c.

THE TEXT.

Every season of the year has its proper pulse.

In the first and second moon, the season when wood is predominant, the pulse of the liver, which answers to wood, is Hien, that is a long tremulous motion, somewhat resembling that of the strings of the instruments called Tçeng.

In the fourth and fifth moon the pulse of the heart, which answers to fire, is as it were overflowing, Hong.

As for the stomach, which answers to the earth, its pulse at the end of every season, that is the third, sixth, ninth, and twelfth moon, ought to have a moderate slowness, Ouan. In the seventh and eight moon, which is the reign of metal, the pulse of the lungs, which answers to it, is slender, Sië; superficial, Feou; short, Toan; and sharp, Sæ.

In the tenth and eleventh moon is the reign of water, to which the pulse of the kidneys answers, and is deep, Tchín; and slender, Sië.

EXPLANATION.

That is, if the pulse of the heart is deep and slender, Tchín and Sië; that of the liver short and sharp, Toan and Sæ; that of the kidneys slow, Ouan; that of the lungs overflowing, Hong; and that of the stomach long and trembling, Tchang and Hien.

THE TEXT.

The distemper is not great, if the alteration is such as an infant may undergo from his mother.

EXPLANATION.

For example, if the pulse of the heart is slow, Ouan; that of the stomach full and overflowing, Hong; that of the lungs deep, Tchin.

THE TEXT.

But the distemper will be long, if the mother loads the infant.

EXPLANATION.

For example, if the kidneys communicate their disorders to the liver, or the liver communicate its distemperature to the heart.

REMARK.

The explanation is literally translated, but the commentator does not seem to express himself very exactly.

THE TEXT.

In short, if the husband and wife do not keep themselves in order, there are rules to judge if the disease is mortal or not.

EXPLANATION.

For instance, if the heart has the pulse of the lungs, it is the husband that has the pulse of the wife.

THE TEXT.

To have the pulse of the lungs in the spring-season

is mortal; for the pulse of the heart is set aside, and the heart is the son of the liver, which has the kidneys for its mother, and the stomach for its wife.

EXPLANATION.

Wood, fire, earth, metal, water; this is the order of the generation of the five elements: Earth, wood, water, fire, metal; in this order they destroy each other: Of the five Tfang, or noble parts above mentioned, the lungs answer to metal: Metal destroys wood. Thus in the spring, which answers to wood, it is mortal to have the pulse of the lungs.

THE TEXT.

It is not good to have the pulse of the stomach in the spring, the pulse of the heart in the winter, that of the lungs in summer, and that of the liver in autumn.

Thus you have what relates to the different pulses proper to the different seasons, with respect to the order of the generation, or the opposition of the five elements.

EXPLANATION.

In a passage of this book it is said, that when in the spring one has the pulse at the end of the four seasons, otherwise called the pulse of the stomach, which answers to the earth, the distemper generally is not dangerous, and is frequently got over without taking any drugs.

Here it is said, that it is mortal to have the pulse of the stomach in the spring; how then can these two assertions agree? In the following manner; for ex-

ample; when in the spring the pulse of the liver is slow and tremulous, though it has this slowness proper to the pulse of the stomach, if it preserve the tremulousness proper to it, the alteration is not great, but if it loses the tremulous quality, and has nothing but the slowness proper to the pulse of the stomach, which answers to the earth, the disease will then be dangerous.

The earth, when it is predominant, generates metal: metal destroys wood, which answers to the liver and spring: This is the solution of the proposed difficulty, and the meaning of the place where the text says, If the husband and wife do not keep themselves in order, &c. Let the proper pulse of the rest be applied to this.

REMARK.

The Chinese refer the two first months of the spring to wood; the two first of the summer, to fire; those of the autumn, to metal, and those of the winter, to water; and the last month of every season they refer to the earth.

When speaking of the five planets, they call Saturn the planet of the earth, Jupiter the planet of wood, Mars the planet of fire, Venus the planet of metal, and Mercury the planet of water.

I cannot say whether the five elements have given names to the five planets, or the number of planets have been determined by the five elements.

THE TEXT.

Great care must be taken not to confound the various kinds of the pulse, which in some manner resemble each other; for example, the pulse that we call

Hien, and that which we name Kin; the pulse Sæ, and the pulse Ouei; the pulse Feou, and the pulse Kong; the pulse Hong, and the pulse Che, have some relation to each other; and yet their indications are very different, and frequently contrary. The pulse called Tchin, and that named Fou, come to the same end by different ways: As for the two pulses, Siu and Yo, they have a kind of relation even in their indications.

REMARK.

You will find the explanation of these various names frequently in the text: However, as a regular method requires that all the terms should be explained in the same order they are mentioned, that the defect of the compiler may be supplied, I shall explain the different sorts of pulses of which he speaks.

When the pulse has a long and tremulous motion, somewhat resembling the strings of the instrument Tçeng, it is called Hien.

When it has a short and quick tremulous motion, like that of the cords of the instrument called Kin, it is named Kin.

When the pulse raises a sensation in the finger, resembling the motion of a knife when it scrapes a bamboo, it is called Sæ.

When the pulse is small, much like a filken thread, it is called Ouei.

When the pulse, upon one's gently laying the finger on it, is sensible, but disappears when more closely pressed, it is termed Feou, superficial.

When the pulse seems under the finger much like the hole of a flute, leaving a kind of empty space in the middle of two sensible extremities, it is named Kong.

Hong signifies overflowing, and Che signifies full;

Tchin signifies deep, low; Fou, lying low, and concealing itself; Siu is when it is perceived by the finger to be like a drop of water; Yo is weak.

THE TEXT.

One must apply diligently to understand the properties of the pulse, and to draw proper consequences from it; after which, by a sufficient knowledge of drugs, one may undertake the curing of diseases.

If the pulse of the wrist is Kie, quick, then there certainly is a pain in the head; if it is Hien, long and tremulous, it is a sign of the heart burn; if it is Kin, short and tremulous, it indicates the cholick; if it is Ouan, moderately slow, the skin is as it were in a sleepy state; if it is Ouei, small, the breast has taken cold; if it is Sou, vastly quick, there is a surprising heat at the orifice of the stomach; if it is Hoa, slippery, blood is predominant; if it is Sæ, sharp or rough, there is a failure in the spirits; when it is Hong, overflowing, the breast and sides are too full, and the patient feels an oppression there; when the pulse of the wrist is Tchin, deep and low, the back most assuredly is pained.

When the pulse seems to be Feou, superficial, and Ouan, moderately slow, exactly at the joining of the wrist with the Cubitus, there is a Nausea, or want of appetite.

If it be Kin, short and tremulous, there is an oppression and fulness of flatulent matter, which cannot easily be cured.

If the pulse is Yo, weak, and Sou, in a hurry, there is great heat in the stomach; if it is long and tremulous, Hien and Hoa, slippery, the illness has been occasioned by cold in the stomach.

If it be Ouei, small, the heart is as it were oppressed with fulness.

If it is Tchin, deep, low, there is a weight and dull pain in the region of the diaphragm, and this proceeds from plethora; whereas if it be Siu, soft, and as it were moist, though there is a swelling in the lower parts, from the reins to the feet, it proceeds from emptiness, and being exhausted, it will be therefore necessary as soon as possible to dissipate the watry humours: In short, if the pulse at the joint is Fou, lying very low, and concealing itself, there is a disorder at the orifice of the stomach, which requires nothing but purgation.

If the pulse at the extremity of the Cubitus be Hoa, slippery, and belongs to a woman, it is evident that her Catamenia are not regular; if a man, the last digestions are not perfect.

If it is Fou, lying very low, the digestions are imperfect in the Primæ Viæ.

If it is Ouei, small, there is a violent cholic: If it is Yo, weak, and Quan, moderately slow, there is an excess of heat in the ventricle, and a disorder in the orifice of the stomach.

If it is Tchi, sluggish, very slow, the Tsiao or lower fire place and stomach have suffered from cold, there is a Nausea, and sometimes a vomiting.

If it is Sæ, sharp or rough, there is a tension in the belly, sometimes of the Scrotum.

If it is sometimes Hien, long and tremulous, sometimes Kin, short and tremulous, the belly itself is pained.

If it is Tchin, deep, the kidneys are affected.

In a word, if it be Siu, soft, and as it were moist, Sou, in a hurry, Feou, superficial, or Kong, empty in the middle, like the belly of a flute, the urine is red

and sharp: Thus exactly examining every thing, no material point will easily escape notice.

REMARK.

The Chinese distinguish three Tiao or fire-places of natural heat in the body, or that which we call the trunk; but this shall be hereafter explained.

The text explaining in this place the various pulses that may be found in the wrist, the joint of the wrist, with the Cubitus, or the extremity of the Cubitus, and specifying their indications, does not make a distinction, as in other places, between the right hand and the left, but only the distinction of the three different places where the pulse is left in each hand.

It must be imagined, according to this notion, that the distinction of right and left, which is of so much consequence on other occasions, has nothing to do with the above-mentioned indications.

THE TEXT.

When you feel a woman's pulse at the extremity of the Cubitus, and find it to be constantly Hoa, slippery, it is a certain sign that she is with child.

If you feel the pulse at this place of the right hand, and find it at the same time Hong, overflowing, she is pregnant of a daughter.

If it is at the left hand that the same is found, she is with child of a son.

If the pulse at the same time is found the same in both arms, the woman is pregnant with two children. He will never be deceived who understands this method.

You must carefully examine the motion and space

of time between each pulse, when you would know if a patient will recover of his distemper.

If the motion is hard and keen, and at the same time very quick, as if the beatings were so many strokes of an arrow or stone repeated very fast: If on the contrary it is loose, somewhat resembling a string which is spinning; if it as it were pricks like the beak of a bird, and this motion is suddenly interrupted; if it is slow and like drops of water which sometimes fall through a crack, insomuch that it sometimes seems to be quite gone, and then begins again; if it is embarrassed much like a frog in certain weeds, insomuch that it seems unable to get backward or forward; if it frisks like a fish that is diving every minute, and then comes up again so slow that one would imagine it was held by the tail, and yet makes its escape; why then the best of these pulses is worth nothing at all: Had a physician the philosopher's stone, he could not recover such a patient from his distemper.

But there are certain distempers wherein the patient, without having such a pulse as has been just described, has his hearing disturbed, loses his speech, or has a small squeaking voice, sometimes one cannot even discover any motion of the pulse either in the wrist or joint: If however at the extremity of the Cubitus, the pulse is still sensible, if the beating and the spaces between have much the same extent, and the motion continues pretty regular for some time, though the patient appears to be at the last extremity, he will not die; at least he may be saved by a skilful physician. It is the sense of an antient text that says, The tree is without leaves, but the root is still alive.

The Manner of feeling the Pulse.

On the left the heart, the small intestines, the liver, the gall, the left kidney; on the right, the lungs, the large intestines, the orifice of the stomach, the stomach itself, and the right kidney.

EXPLANATION.

The pulse of the wrist belonging to the left hand hath relation to the heart and small intestines; the pulse of the joint of the same side shews what relates to the liver and gall; the pulse at the extremity of the Cubitus of the same side has reference to the left kidney and the bladder; for if the text has not expressed the bladder, it is because he could not bring it into the verse.

REMARK.

Not only this passage, but almost the whole book is in verse.

THE TEXT.

On the right [at the wrist] the lungs, the large intestines; [at the joint] the orifice of the stomach itself; [at the extremity of the Cubitus.]

EXPLANATION.

It is necessary to add to the left kidney the three Tiao, or fire-places; the reason of its being omitted in the text is because it would not agree with the verse.

REMARK.

These three Tiao will be hereafter explained.

THE TEXT.

Let us pursue this doctrine in examining women's distempers, with this exception, that in women the pulse of the Cubitus, in its natural condition, is quite different from that of men.

EXPLANATION.

In women it is strong, and in men, weak; it is a distemper when it is otherwise.

THE TEXT.

You must be attentive and exact in examining and following each of these pulses, and the physician likewise himself should be healthy, and in a state of tranquillity. As for the situation of the hand, it depends on the situation wherein the sick person is; if the latter hath his hand so placed that the back appears, and not the palm, the physician must also turn his.

Nine Heou result from these three pulses. You should be accustomed to distinguish the pulses rightly beneath the fingers, and to receive, at the same time, the impression upon the mind as distinctly as from a seal.

EXPLANATION.

The wrist, the joint, the extremity of the Cubitus,

are the three places where the pulse is felt, by applying the three longest fingers to them, and these are named the three Pou.

The pulse is either very superficial, or very deep, or between both, in these three places: These are what the text calls Heou, three times three making nine.

THE TEXT.

The function of the large intestines, and the lungs, has a tendency to proceed, conduct, and evacuate: The function of the heart, and small intestines, tends to receive, contain, and amend.

EXPLANATION.

The large intestines thrust forward, and evacuate the gross and impure Fæces: As for the lungs, they neither thrust any thing forward nor evacuate; but as there is a relation between the large intestines and the lungs, therefore the text joins them together.

REMARK.

This is very true what the Chinese commentator says, that according to the art of medicine in China the lungs and large intestines sympathize, as well as the heart and the small intestines; but he must certainly be mistaken in saying that this relation is the only reason for which the lungs are mentioned, as though they neither thrust forward nor evacuate; Do the lungs not evacuate phlegm, and send forward the blood and other matter?

He is also very wrong in what he says of the heart, and the small intestines; The text may admit of this

ſenſe, viz. That the function of the ſmall inteſtines is to receive the aliments in order to digeſt them, and convert them into chyle; the function of the heart is to receive the chyle, to digeſt it, and convert it into blood.

THE TEXT.

The function of the orifice of the ſtomach and ventricle, which are contiguous to each other, is to yield mutual aſſiſtance for the adminiſtration of the five grains [that is to ſay the aliments] the function of the kidneys and bladder is to filtre, and evacuate the liquid matters.

What they call the three Tſiao, or the three hearths or fire-places, are not ſenſible and diſtinct Viſcera: They aſſign their ſituation with reference to the other parts, to which they answer.

EXPLANATION.

The Tſiao are ſaid to be three in number, the ſuperior, the middlemoſt, and the inferior.

The ſuperior is the region of the heart; its principal effect is to retain and contract, without which how could the heart govern the blood and ſpirits? Or could they otherwiſe govern the blood and the air? For the character admits of both theſe caſes.

That of the middle is the region of the Sternum; it neither retains nor ſends forwards; its effect is to cook, for without it the ſtomach could not digeſt the aliments.

The inferior is the region of the navel, and an inch beneath: Its effect is to ſeparate and ſend forward, without which the liver and kidneys could not filtre and ſeparate the liquids as they generally do.

THE TEXT.

The liver and bladder both assist in the filtration of humours; they have a considerable communication with the eyes, which depend very much upon the Viscera. A man of understanding, who has well considered the natural situation, the just temperature, and the relation of the noble parts, will presently attain the knowledge of diseases.

From the joining of the arm with the hand there is a bone arises; there the pulse ought to be felt, which is called the gate, or the joint; before this joint is that which is called the socket of the thumb, Tsun keou, the wrist; behind the same joint is what we call the Cubitus, Tché; the wrist is called Yang; the Cubitus, Yn, in the language of the physicians.

You must be careful in placing the fingers exactly upon the vessels where they should be, when you feel the pulse of these three places.

REMARK.

The bone which goes from the hand to the elbow is called Tché; the same character also signifies a foot or a cubit, because the one is the measure of the other.

They call the wrist Tsun keou, which signifies a mouth or socket, or passage of the length of an inch, because it is the tenth part of the Cubitus, and they call an inch the tenth part of a foot or cubit: This is taken from the Chinese themselves.

Yang and Yn are two terms applicable, and applied by the Chinese in almost every distinction of two things, wherein one gives place to the other in some

particular matter; for example, in perfection, rank, &c.

THE TEXT.

You may be assured that there is a pain in the head, if you discover at the Yang [the pulse of the wrist] what is called Hien, [a long tremulous motion, as in the strings of the instrument Tçeng.]

If you find the same motion at the Yn, [the pulse at the extremity of the Cubitus] there is a pain in the belly.

If the Yang is in a hurry there is an inclination to vomit, and a pain in the head: If the Yn is then very slender and very small, there is a motion of the entrails, and a diarrhoea: If the Yang is full you may observe the face red, and puffed up: If the Yn is at the same time small and slender, there will malignant sweats come as it were unawares, and a consumption of the lungs will ensue.

When the Yang is full, strong, and slippery, there is a difficulty in speaking.

If the Yn is then in a hurry there is a great heat in the stomach, and the breath has an ill smell.

When the Yang is small, superficial and weak, there is a want of warmth in the heart.

If at the same time the Yn is slippery, the aliments are ill digested, and the stomach is out of order.

Before and behind the joint you may, by this simple distinction of Yn and Yang, find out the different indications of the pulse, and this is a pretty good method.

REMARK.

In this last sentence the commentator gives a different sense from that of the translation: He pretends

that we must consider the fore and the hind part of the joint together, meant by Yang and Yn, and to see if this Yang and Yn are both Yang, or both Yn; and he understands, by this second Yang, a high superficial pulse, and by this second Yn a pulse lying very deep; if both are Yang, that is, if at the wrist, or at the extremity of the Cubitus, the pulse is superficial, the source of the distemper is in what is called Piao, the exterior, the skin, the flesh, &c. if on the contrary they are both Yn, that is, if at the wrist, and the extremity of the Cubitus, the pulse lies very deep, the disease is in what they call Li, that is in the five noble parts, &c.

It is hard to say whether the commentator says true or not, but the text has not these two kinds of complicated Yn or Yang, nor has he spoke of the Piao or Li, nor of the superficial or the deep, and these lines seem to me to be nothing more than a general conclusion of what went before.

THE TEXT.

When the pulse is natural, and the health perfect, in the space of one respiration, which consists of an inspiration and expiration, there are four pulses; one pulse more presages nothing bad, but if there wants one it shews a defect of natural heat, and if there be two wanting it is very bad.

If in the same space there are six pulses, there is an excess of heat, if there are seven the excess is considerable, but if they arise to eight the danger is very great, and if more the patient will not live long.

If a pulse beats but once in the space of a respiration, the distemper is then considerable and dangerous; but is much worse if it beats but once in the

space of two, for it is a certain sign of the near approach of death.

Excess of heat occasions too many beatings of the pulse, and excess of cold too few: This is a constant tradition of all ages; the different degrees of it are set down in the book of the eighty one difficulties.

In the spring the long tremulous pulse Hien; in the summer the overflowing Hong; in autumn softness of hair or feathers; in winter hardness of stone: It is necessary to subdivide these seasons into Tsie ki.

EXPLANATION.

By the character Tsie is understood the subdivisions which are made of the four seasons: Every season has six Tsie: By the character Ki is understood the different temperatures of the air.

THE TEXT.

A soft motion, and pretty flow, somewhat resembling that of the branches of a fine willow-tree agitated by the breath of a gentle zephyr in the spring of the year: This is the property of the pulse which is called the pulse of the stomach, which answers to the end of every year: However nice these distinctions are, an experienced physician will not only perceive them, but he will be able at length not to forget one.

The Explanation of the Pulse called The Seven Piao.

REMARK.

[That is to say, The Seven Externals] because they

are in reality more external, and more sensible than the rest, which will afterwards be taken notice of.

THE TEXT.

Feou is when, laying the finger gently without supporting it, the pulse is perceived, and gives a sensation like that of the blade of a little onion.

REMARK.

In the translation I call it superficial.

THE TEXT.

Kong is when we distinguish, as it were, two extremities, and an empty space in the middle.

REMARK.

As if the finger was put upon a hole of the flute; the Chinese themselves make this comparison.

THE TEXT.

Hou is as if one touched or put ones fingers among pearls: They move backward and forward very quick, being smooth and slippery.

REMARK.

This is the same that is called a slippery pulse in the translation.

THE TEXT.

Ché is, as it were, a property of the Feou, superficial; and as if the blade of a small onion was full and solid within.

REMARK.

I call it a full pulse in the translation.

THE TEXT.

Hien resembles the strings of Tçeng.

REMARK.

This I name a long tremulous pulse.

THE TEXT.

Kin resembles the strings of the instrument Kin.

REMARK.

I call it a short tremulous pulse.

THE TEXT.

Hong is when the pulse rises the highest, and the beats are very strong.

REMARK.

I call it overflowing; the Chinese character admits of this sense.

THE TEXT.

These are the seven Piao, which are Yang, like the best side of a stuff with regard to the eight following called Li, which are like the wrong side, and consequently Yn.

An Explanation of the Pulses called The Eight Li.

REMARK.

That is to say the internal, because they are in effect more inward, and less sensible than the seven just explained.

THE TEXT.

Tchin is when there is a necessity of pressing hard to find the pulse.

REMARK.

This I call a deep pulse.

THE TEXT.

Ouei is when the pulse feels under the finger as small as a thread.

REMARK.

I call it the small pulse.

THE TEXT.

Cuan is when it is moderately slow.

Sæ is when the beats make an impression, which has some relation to that of a knife scraping a bamboo.

REMARK.

I call it sharp; the Chinese character properly signifies rough.

THE TEXT.

Tchi is when it comes very slowly, and as it were concealing itself.

REMARK.

This I call the sluggish, or slow pulse.

THE TEXT.

Fou is when it flies, if I may so speak, very low, and is as it were concealed under the bone, insomuch that you must press very hard to discover it, and even then it is not very distinct.

REMARK.

I call this flying low; the Chinese character signifies to bend down.

THE TEXT.

Siu is when it yields a sensation like a drop of water when touched.

REMARK.

I call it the soft, and as it were the fluid pulse.

THE TEXT.

Yo is when pressing moderately one perceives it, but not in a distinct manner, and which yields a sensation not unlike an old piece of stuff when it is touched; and when pressing a little harder it is not perceived at all.

*An Explanation of the Pulses called The Nine Tao, or
The Nine Manners.*

Tchang is when it yields a sensation like a staff, or the handle of a spear.

REMARK.

I call it long, which is the signification of the character.

THE TEXT.

Toan is when it is perceived almost like an individual point.

REMARK.

I call it short, which is the meaning of the character.

THE TEXT.

Hiu is when the finger is laid on gently, and the beating of the pulse is not observed.

REMARK.

This I call empty, it being the signification of the character Hiu.

THE TEXT.

Tsou is when it seems confined, and moves with difficulty, particularly at the wrist.

Kie is when, being otherwise a little slow, it seems sometimes to stop.

REMARK.

I call it the embarrassed pulse.

THE TEXT.

Tai is when it is found suddenly to stop, and returns with difficulty.

REMARK.

This Tai is differently explained in another place.

THE TEXT.

Sié is when it is very fine and slender, and seems like a single hair.

REMARK.

I call it the slender pulse.

THE TEXT.

Tong is when the sensation that it yields has relation to that made by stones when they fall into the water.

REMARK.

I call it the moveable pulse, which is the meaning of the character Tong.

THE TEXT.

Ké is when it is found hard and smooth like a drum-head.

REMARK.

I call this pulse hard, which signification it has in other places.

THE TEXT.

These nine different manners must be carefully distinguished, which cannot be easily done.

REMARK.

Very few of the Chinese physicians, I have been informed, at this time examine after these nine ways, being satisfied with the seven pulses called Piao, and the eight named Li; nay there are some who neglect them all, being content to judge, as well as they can, concerning the nature of the disease by the height and depth of the pulse, and by its slowness and quickness.

These pulses are all explained over again near the conclusion of this treatise, and some of them have a different name from what they have in this place, and a different explanation, with respect to the terms, though very near the same as to the sense; these differences and repetitions strengthen the opini-

on of this being a compilation, and not written by one hand.

Indications of these several Pulses.

The superficial Feou indicates windiness: The Kong, which has two sensible extremities, and a space in the middle, indicates a want of blood.

R E M A R K.

I determined the sense of this agreeable to the explanation, as the text does not express whether there is a want of or too much blood.

T H E T E X T.

The slippery [Hoa] indicates plenty of phlegm.

The full [Ché] signifies heat.

The long tremulous [Hien] weariness.

The short tremulous [Kin] sharp pain.

The overflowing [Hong] excess of heat.

The small [Ouei] too much cold, they both indicate obstructions in the lower-belly.

The deep [Tchin] indicates pain proceeding from intercepted air, or else from the interruption of the course of the spirits: The Chinese character admits of both senses.

A slow pulse [Ouan] when it ought not to be so, indicates a kind of rheumatism in the breast.

The sharp pulse [Sæ] indicates barrenness, or a disposition to it, as well in the male as female sex.

The sluggish [Tchi] shews a defect of internal heat.

The flying-low [Fou] indicates a considerable ob-

struction, which shuts up, as it were, the passages of the blood.

The soft or fluid [Siu] indicates spontaneous heats, and a disposition to a consumption.

The weak [Yo] shews a great wasting, and dull pains as it were in the bones.

The long [Tchang] shews that the spirits are in good quantity and good order.

The short [Toan] shews that they fail, or are troubled.

When the pulse is slender, like a hair, it is a sign of the failure of the spirits.

When it is variable [Tai] they are in disorder.

The pulse embarrassed, confined, and as it were in a strait, [Tfou] indicates excess of heat.

The empty pulse [Hiu] commonly follows a great loss of blood: It is accompanied with vain fears and convulsive motions.

The hurrying pulse [Sou] which was not placed before among the nine manners, indicates inquietudes of another kind, and a delirium, at which time the disease is considerable and dangerous.

The hard pulse [Kie] indicates a loss of the feminal liquor in men, and of blood in women.

REMARK.

I know not for what reason the embarrassed pulse [Kie] and the moveable [Tong] are omitted in these indications.

EXPLANATION.

When a sick person has a long pulse [Tchan] especially if it is a little slow at the same time, the distemper is commonly easy to be healed; on the contrary in

almost all diseases the short pulse [Toan] indicates danger and difficulty of cure.

THE TEXT.

The Resemblance and Difference of various Pulses.

The superficial pulse [Feou] resembles the pulse called [Kong] with this difference, that the latter seems empty in the middle, the former not: The superficial [Feou] is also like the overflowing [Hong] the difference lies in one's being stronger than the other; the overflowing having much strength, the superficial but little: The superficial [Feou] has some sort of relation with the empty pulse [Hiu,] they both yielding a slight sensation under the finger; but this proceeds from very different causes; it is want of strength in the empty pulse, whereas in the superficial it proceeds from not being sufficiently pressed; the nature of the pulse being such, that in laying on the finger without pressing it is perceived, and disappears if it be pressed.

The slippery pulse [Hoa,] and the moveable [Tong,] have a relation very like that of pearls being moved in a vessel, and stones moved in the water, one is more distinct than the other. The slippery [Hoa] has likewise a relation with the hurrying [Sou,] but the hurrying [Sou] has a greater number of beats in the same space of a respiration.

The full [Che] somewhat resembles the hard [Kie,] but the hard never changes by being more or less pressed; whereas the full becomes stronger and longer, if the fingers be laid on more hard.

The long tremulous [Hien,] and the short tremulous, have relation to each other; the latter expresses the essential character of the tremulousness, which

is common to them both; the former expresses its condition with much greater strength.

The overflowing [Hong,] and the large or strong [Ta,] very much resemble each other; but the overflowing [Hong,] though pressed hard, always preserves its strength, which does not happen every time when the pulse is strong [Ta.]

The small [Houei,] and the sharp [Sæ] have some relation, but the sharp is more short and sluggish than the small: [Sie] the slender or fine is properly the small, [Ouei,] becomes fine as a hair or down.

The deep [Tchin,] and the flying [Fou] are very much alike; the latter is only deeper, and is not so easily discovered.

The slow, [Ouan,] and the sluggish [Tchi,] differ only in this, that the first is moderately slow, in comparison of the other: The sluggish [Tchi,] and the sharp [Sæ] have some resemblance; but the sluggish [Tchi] has but three beats in the space of a respiration, whereas the sharp [Sæ] has a fourth, though a little embarrassed.

The weak [Yo,] and the soft [Siu,] are very much alike; the latter is small, soft, and seems moist; the former has nothing but what is necessary to its being felt under the finger.

The three pulses abovenamed, Kie, T fou, Tai, the embarrassed, the confined, the variable, though they resemble each other, have also their differences; the first has a just slowness, whereas the second is in a hurry; the spaces between the beats of the second are not regular, and those of the third are; the scattered pulse [San] resembles the pulse called [Ta] the great: The difference is that the first is looser, more slow and superficial, whereas the second has even some consistency in it.

REMARK.

The above exposition of the pulse has no pulse called scattered [San,] which is another proof that these verses were composed by various hands.

THE TEXT.

Seven Cautions which must be observed by a Physician when he is about to feel the Pulse.

1. He must be in a peaceable disposition of mind.
2. He must be as attentive as possible, laying aside even the smallest disorder or absence of mind.
3. With regard to his body he should also be in a state of tranquillity, inasmuch that he ought to find his respiration free and regular.
4. After he has laid his finger softly, and touched lightly the skin at the places undermentioned, he should examine that which regards the six Fou.
5. After this let him lay on his fingers more hard, moderately pressing the flesh to examine how the pulse is, which is called the pulse of the stomach, the situation whereof, says the commentator, ought to answer to the moderate temperature of the four seasons.
6. Then let him press so hard as to feel the bone, and let him examine what relates to the five Tfang.
7. Let him examine the quickness and slowness of the pulse, and if the number of its beats be more or less than it ought to be in the space of a respiration.

REMARK.

The five Tfang are the heart, the liver, the orifice

of the stomach, the lungs, the kidneys; the six Fou are the small intestines, the gall-bladder, the stomach, the large intestines, the bladder, and that which they call the three Tsiao, the three fire-places or stoves.

THE TEXT.

Seven Kinds of Pulses which indicate Danger of Death.

When the pulse is perceived, under the fingers, to bubble irregularly like water over a large fire; if it be in the morning when the pulse is felt, one may affirm that the patient will not live till night.

The patient is as near the approach of death, if the pulse seems like a fish whose head is stopped in such a manner that he cannot move, but has a frisking tail without the least regularity; the kidneys are affected when this is the case.

There is danger of death, but it is not so very near, when the pulse, after having been in a hurry, suddenly changes, and becomes slow and sluggish.

If the pulse, by the hardness of its beats, resembles in some sense a round stone, or dry earth shot out of a cross-bow, the lungs and the stomach want spirits, and this is not a slight failure, but a rooted distemper.

If the pulse seems like drops of water that fall into a room through some crack, or any small hole in the roof, and when in its return it is scattered and disordered much like the twine of a cord which is unravelled, the bones are dried up even to the marrow.

Death is also near when the motion of the pulse, at the extremity of the Cubitus in both arms, resembles the pace of a frog when he is embarrassed in the weeds, or that of a toad.

If the motion of the pulse resembles the hasty pec-

king of the beak of a bird, there is a defect of spirits in the stomach, and one may conclude that the heart does not perform its functions well, and that the blood is in a bad state.

EXPLANATION.

There are several pulses which indicate the danger of death: I shall fully explain them, that those who apply to these matters may understand them more clearly.

Fou foe, the bubbling of the kettle, otherwise Yong Siuen, a bubbling spring, is the name of the first pulse: This is when the pulse always seems to throw itself outward, somewhat like the bubbles which arise upon a boiling liquor; the patient will not live a day when his pulse is in this condition, and no more medicines need be given him.

Feou ho, a union or continuity of waves, is the name of the second; that is when the latter beat incroaches upon the former, not unlike one wave's getting ground of the other before the first is levelled.

Tan che, the stone or bullet of a cross-bow, is the name of the third; that is when the pulse coming from between the bones, beats hard and dry against the fingers.

Tchio tso, the pecking of a bird, is the name of the fourth; that is when the pulse beats three or four times in a hard and sharp manner against the fingers, then ceases a while, and returns in the same manner like a bird pecking grain.

Vou leou, a crack by which the water drops into a house, and when it has ceased for some time the pulse beats feebly again, like a small drop that slides thro' a crack, is the name of the fifth: This pulse, and the

precedent, indicate that the stomach, heart, and lungs are in a very bad state.

Kiai so, a string that is unravelled, is the name of the sixth; that is when the pulse is disordered and dispersed in such a manner that one cannot perceive the return of any regular motion: Then the five Tfang are in a bad condition.

Yu tsiang, the frisking of a fish, is the name of the seventh; that is when the beating of the pulse being generally superficial there are deep ones mixed with them; it is felt, and then disappears, nor is it known what is become of it; the kidneys cease to perform their functions.

Hia yeou, the gatt of a toad, is the name of the eighth; that is when the pulse being felt softly it is not perceived for some time, because it is deep, [Tchin] and suddenly there appears a superficial beating, [Feou] but weak, which presently ceases, and after some time performs the same over again: At that time the stomach and its orifice are in a very bad state.

Yen tao, otherwise Siun tao, the strokes of a knife following each other, is the name of the ninth: This is when the pulse being fine and slender, like a filken thread, has nevertheless hard and cutting beats, like the strokes of the point of a knife or a needle.

Tcheouen teou, rolling pease, is the name of the tenth: This is when the beats are pretty strong, very short, hard, and sharp; the spirits of the [San yuen] three principles absolutely fail.

REMARK.

What is to be understood of these principles [San yuen] I have not met with in any book.

The Sequel of the Explanation.

San ye, scattered leaves, is the name of the eleventh; that is when the motion of the pulse imitates the leaves that fall from the trees by irregular intervals.

Ouei tou, earth thrown thereon, is the name of the twelfth; that is when hardness and emptiness at the same time is found at the motion of the pulse.

Hiuen yong, a deep and dangerous imposthume, is the name of the thirteenth; that is when, in feeling the pulse it feels, under the fingers, like the prickings of an imposthume that does not easily become ripe.

Yn yuen, like a little round ball, is the name of the fourteenth; that is when the pulse is so slippery that if the fingers are not pressed hard it will escape.

Yu kiong, resembling a pestle, is the name of the fifteenth; that is when the beats are at the same time very high and full.

Ju tchoui, like the breath of a man who puffs and blows, is the name of the sixteenth; that is when the pulse seems always to thrust outwardly without remitting.

Pie lie, the rolling of thunder, is the name of the seventeenth; that is when the pulse, being at first pretty still, falls immediately into a hurry of beating, and afterwards disappears, somewhat resembling a flight of storm that is dispersed.

There is also another pulse called Y, overflowing; that is when at the wrist the blood, instead of proceeding forwards, seems to recoil and get upon what is called Yu tsi, which is the extremity by which the first and largest bone of the thumb is joined to the wrist.

Besides, there is the pulse Fou, turning back; that

is when the blood, instead of passing freely the usual way by the joint of the wrist and Cubitus, returns as it were backward, and renders the pulse slippery at the extremity of the Cubitus.

Directions for the proper feeling of the Pulse.

THE TEXT.

He must be in a calm situation of mind and body who feels the pulse; if the patient be a woman, he takes the right hand, if a man, the left.

REMARK.

Several physicians feel the pulses of men at both hands.

THE TEXT.

He first places the middle finger exactly upon the joint of the wrist with the Cubitus, then the two next fingers, one on each side: He must press very gently at first, then a little harder, and then very hard; but he must be sure that his fingers are adjusted as they should be, after which he may proceed to examine the pulse in the three places appointed, laying it down for a rule, that when the pulse is regular there are four beats in the time of an inspiration and expiration, or five at most.

He must likewise remember what ought to be the natural and healthy situation of the capital pulses, viz. The pulse of the stomach, the pulse of the season, and the pulse proper to each of the five Tfang, and the six Fou, to pass the examination of the pulse of the distemper.

The three pulses of each arm naturally incline to the long tremulous in all the spring-season: In the summer they incline to the overflowing: During the autumn they incline to the superficial, and in the winter to the deep.

The pulse at the end of every season, commonly called the pulse of the stomach, is a pulse of an equal and moderate slowness, and is perceived by a moderate pressure.

The following are the natural and healthy pulses of every one of the 'Tfang, and every one of the Fou; that of the heart superficial, strong and spreading; that of the lungs superficial, sharp, and short; that of the liver long, tremulous, but equal enough; that of the stomach moderately slow, strong, and hard; that of the kidneys deep, soft, and slippery: These are the natural properties of these pulses.

It is a sure sign of health when they are found in this state, and in a just temperament; but if there be any excess or defect it is a distemper.

It is an outward distemper when there is an excess found, and the pulse beats with violence and plentitude; and it is inward when it is a defect, and the pulse becomes as it were empty and small.

REMARK.

Neither the text nor the commentator determine what we are to understand in this place by outward and inward; I thought it necessary to take notice of it here, because it will afterwards be mentioned again.

THE TEXT.

The finger need not be applied many times, when

the patient has a long wrist; but when he has a short one, there must be several trials, very near each other.

Every time the finger is applied there are three manners of distinguishing it; for the pressure is very gentle, or very strong, or between both: In all these circumstances examine the nature of the pulse in order to discover the seat of the distemper.

We must also examine in the pulse what is called ascending, descending, coming, retiring, beating, ceasing: The pulse is called ascending, when it goes from the extremity of the Cubitus to the wrist; from the wrist to the Cubitus is called descending: In the first Yn produces Yang, and in the second Yang produces Yn.

REMARK.

I have translated this place literally, but I must own I cannot thoroughly understand it.

THE TEXT.

To proceed as it were from between the bone and the flesh to the skin, is called Coming; from the skin to return between the bone and the flesh, is called Withdrawing: In short to make itself felt, is called beating; not to make itself felt, is called ceasing.

Besides, it is necessary to have respect to what is called Piao, the outside, which is sensible; and Li, the inside, which is less sensible; to what is called Hiu, inanition; and Che, repletion.

That which is called Piao, the outside, or most sensible, is Yang, with reference to what is called Li, the inside, or less sensible; such are the six Feou, for instance, with respect to the five Tfang.

Every alteration and irregularity in the vessels, and

in the carnous parts, without affecting the stomach one of the six Fou, or the Tfang, is likewise reduced to what we call Piao, an outward disease, and more apparent and more sensible.

But the irregularity of the spirits caused by the seven passions, which are, as it were, concentrated in the heart, and the belly, without being able to surmount and appease them, as well as all the distempers caused by the quantity or quality of the elements which abide in the Fou, and the Tfang, without being well evacuated by the ordinary ways; all this is reduced to what is called Li, the interior, that which is less apparent and less sensible.

That which is called, [Hiu] inanition, is when the vital and primogenial spirits being, as it were, entirely dissipated, no strength remains.

That which is called, [Che] Repletion, is not the vigour and abundance of the vital and primogenial spirits; so far from that, that it is the abundance of peccant humours, which overpower the spirits.

Thus in what is called, [Hiu] Inanition, there must be an endeavour to restore the spirits, and in what is called, [Che] Repletion, there must be an attempt to evacuate whatever is hurtful, and occasions the disorder.

It is necessary to have judgment in feeling the pulse; the usual rule is to press but little, when regard is had to the six Fou, and to press much harder in the examination of what relates to the five Tfang: According to this rule, taken rigorously, the pulses Yang have all relation to the five Tfang.

REMARK.

By Yang is to be understood here the exterior, superficial, sensible; and by Yn the deep, concealed, and less sensible.

THE TEXT.

But in this, as in almost all the rest, there is often in the Yn a little of the Yang, and in the Yang a little of the Yn: There are pulses Feou, superficial, high, sensible, which have relation to the Tfang; and there are Tchín, deep, concealed, less sensible, which have relation to the Fou: For this reason it is necessary to proceed with a great deal of judgment.

Prognosticks by the Pulse in various Diseases.

In hot, malignant and contagious distempers, when the patient perceives a burning drought, accompanied with anxiety, and violent, but irregular motions, if the pulse is [Feou ta] superficial and strong, it is a good sign, and the patient is like to get over it.

If it happens that he is delirious, has a diarrhoea, and the pulse is [Hiu siao] empty, and small, it is a sign of death.

In swellings of the belly the pulse superficial and strong is good, but if empty and small it portends death.

In malignant fevers, either proceeding from heat or cold, the pulse overflowing and strong is good; the deep and slender is mortal.

In the distemper [Siao ko] immoderate hunger and thirst, the pulse hurrying and strong is good, but empty and small, mortal.

In Hemorrhagies of the nose the pulse deep and slender is good, but superficial and strong is mortal.

In shortness of breath the pulse superficial and slippery is good, but short and sharp is mortal.

In diarrhœas and dysenteries the pulse small is good, but superficial and overflowing is mortal.

In aqueous dropsies the pulse superficial and overflowing is good, but deep and slender is mortal.

In cardialgias the pulse deep and slender is good, but superficial and strong is mortal.

In superficial swellings, perhaps such are meant that are caused by the air or intercutory wind, the pulse superficial and clean [Feou Tsin] is good, but small and slender is mortal.

In spitting of blood the pulse deep and weak is good, but full and strong is bad.

In vomiting of blood the pulse deep and slender is good, but superficial, overflowing, full and strong is bad.

In a cough the pulse superficial and flabby is good, but deep, and flying low, is bad.

In a woman, newly brought to bed, the pulse moderately flow and slippery is good, but very tremulous and hurrying is mortal.

In internal repletions the pulse overflowing and full is good, but deep and slender is bad.

In diarrhœas and obstinate fluxes the pulse small and slender is good, but superficial and overflowing is mortal.

In excessive sweats the pulse empty and small is good, but tremulous, confined and hasty is bad.

In hot indispositions after child-bearing the pulse moderately flow and slippery is good, but tremulous and quick is mortal.

When a person is internally exhausted the pulse deep

and slender is good, but overflowing and strong is bad.

When a person is exhausted both inwardly and outwardly, at the same time, the pulse full and slippery is good, but deep and slender is bad.

In the Distemper called Ho loan.

[It is a violent cholick, greatly resembling that which is called in the East-Indies, Modechin] the pulse superficial and overflowing is good, but slender and slow is mortal.

In wounds by steel the pulse small and slender is good, but confined and quick is mortal.

In a consumption of the lungs the pulse superficial and slippery is good, but confined and strong is mortal.

In a sudden apoplexy the pulse tremulous, short and slender is good, but superficial and strong is mortal.

In considerable obstructions of the intestines the pulse slippery and strong is good, but short and slender is bad.

You may judge, by an examination of the three pulses of each arm, if the disease proceeds from inanition, or a defect of the spirits and blood, or if it arises from a plenitude of the peccant humours; and if it resides in what is called Piao, the upper part, the outside, (the skin, the vessels, the muscles) or if it lies in what is called the interior (the noble parts, &c.)

In this examination there is no use made but of the distinction of two sorts of pulses, the superficial and the deep: The first will answer to what is called Piao, the second to what is called Li: They make the pulse of the wrist to preside over the region of the heart and lungs as superior; the pulse of the joint over the region of the liver and stomach; the pulse of the extremi-

ty of the Cubitus over the region of the kidneys, intestines, as well great as small, &c.

According to this method they then explain what parts are subject to the pulse of the wrist of the left arm.

When the distemper proceeds from Hiu, (this word has been explained above) and it resides in what is called Piao, the outside, the pulse of the wrist at the left arm is superficial, but without strength; the skin has not its natural consistence, the person has involuntary sweats, is fearful of the wind and air, and is very sensible of cold.

On the contrary if the distemper comes from [Che] a bad repletion in what is called Piao, the outside, the pulse of the left wrist is outwardly superficial, but at the same time strong; there are pains in the head, and heat throughout the body, and sometimes the mouth is dry.

When the distemper arises from inanition, [Hiu] and resides in what is called Li, the inside, the pulse of the left wrist is deep and weak, attended with unreasonable fears, panic terrors, loss of memory, trouble of mind, want of sleep, and a dislike to hear any body speak.

If on the contrary the distemper arises from [Che] a bad repletion, and resides in what is called Li, the inside, the same pulse of the left wrist is likewise deep, but it is strong at the same time: Then there is anxiety, agitations, fretfulness, internal heat, madness, raving, an aversion to every thing that is hot, thirst.

According to the same method they explain what relates to the pulse of the joint of the left wrist.

When the distemper proceeds from inanition, [Hiu] and resides in what is called Piao, the outside, the pulse

of the left joint is superficial but weak; the eyes have a wild look, and the sight is disturbed.

If the distemper comes from [Che] a bad repletion, and resides in what is called Piao, the outside, the pulse is likewise superficial, but then it is strong: The patient perceives a pain in the hypochondria, with a tension of the belly, the eyes are swelled and disordered.

When the distemper arises from [Hui] inanition, and resides in what is called Li, the inside, the pulse of the left joint is deep and without strength, the patient is fearful and suspicious, and his complexion turns yellow.

If the distemper comes from [Che] a bad repletion, and resides in what is called Li, the inside, the same pulse is still deep, but it has strength withal: Such people have abundance of gross, viscous humour, are subject to fall into a passion, have contractions of the nerves, with pains in the groin, and in the scrotum.

According to the same method they explain that which relates to the extremity of the left Cubitus.

When the distemper proceeds from inanition, [Hui] and resides in what is called Piao, the outside, the pulse of the extremity of the left Cubitus is superficial, but without strength; there are spontaneous and malignant sweats, deafness, a painful weight in the bladder, and an extraordinary contraction of the urethra.

If the distemper comes from [Che] a bad repletion, and resides in what is called Piao, the outside, the same pulse is still superficial, but at the same time it is likewise strong: Then there is a disury or difficulty of making water, a pain in the urethra, and the urine is red and thick.

When the distemper comes from inanition, [Hui] and resides in what is called Li, the inside, the same

pulse of the left Cubitus is [Tchin] deep, and without strength; the kidneys want spirits, cold is predominant; there is a gout or a painful rheumatism, especially in the region of the loins, and in the knees, with a pain at the scrotum.

REMARK.

They have not mentioned here the case of a disease proceeding from [Che] and resident in what is called Li, the inside; I believe that in the copy from which this book was printed the writer had omitted a line.

THE TEXT.

According to the same method they explain what relates to the pulse of the right wrist.

When the disease comes from inanition, and resides in what is called Piao, the outside, the pulse of the right wrist is superficial, but without strength: There are spontaneous sweats, a dread of cold and wind, the back especially is sensible of cold, there is an itching in the skin, and the nose runs very much.

If the distemper comes from [Che] a bad repletion, and resides in what is called Piao, the outside, the same pulse of the right wrist is still superficial, but it is likewise strong: The patient perceives a great heat throughout the body; there is a great pain in the head, attended with a stupor, and every thing seems to turn round.

When the distemper proceeds from inanition, [Hiu] and resides in what is called Li, the inside, the pulse of the right wrist is deep and without strength.

If the distemper comes from [Che] repletion, and resides in what is called Li, the inside, the same pulse

of the wrist is likewise deep, but it is likewise strong: The peccant humours abound in the Viscera; there are frequent fits of coughing, a great deal of phlegm that cannot be brought up, a shortness of breath and oppression.

According to the same method they explain what relates to the pulse of the joint of the right wrist.

When the disease comes from inanition [Hiu,] and resides in what is called Piao, the outside, the pulse of the joint of the right wrist is superficial, but without strength: The patient can neither move his arms nor legs, has a spontaneous lassitude, and is exceeding sleepy; sometimes the face and eyes are swelled.

If the distemper comes from [Che,] a bad repletion, and resides in what is called Piao, the outside, the same pulse is likewise superficial, but it has strength withal: The belly is swelled, and there is a great oppression in the breast and diaphragm.

When the distemper arises from inanition [Hiu,] and resides in what is called Li, the inside, the pulse of the joint of the right wrist is deep, and without strength; there is an emptiness in the kidneys, they not performing their functions as they ought, and secreting but little urine; sometimes an enormous weight in the region of the loins; sometimes a sharp pain, and the patient is not able to turn himself about.

If the distemper comes from [Che,] a bad repletion, and resides in what is called Li, the inside, the same pulse is still deep, but it has likewise strength; the patient cannot bear cold, there is a pain in the scrotum, which extends even to the loins, and sometimes the lientery.

REMARK.

There seems to be something wanting here, for there is nothing said that relates to the pulse of the extremity of the right Cubitus.

The Pulses of the seven Passions or Affections of the Mind.

In joy the pulse is moderately flow; in compassion it is short; in sadness it is sharp or rough; in anxiety it is in disorder; in fear it is deep; in a sudden fright it is in a flutter; in anger it is confined and in a hurry.

The Difference of the Pulses according to the Sex.

In a man the pulse of the wrist should always be more strong than that of the Cubitus; if the contrary happens it is unnatural, and indicates a defect in the kidneys.

On the contrary the pulse of a woman at the Cubitus ought always to be more strong than that of the wrist; if it happens otherwise it is unnatural, and this indicates a defect in the Tiao, the superior stove or fire-place.

The Difference of the Pulses according to different Ages.

In an old man the pulse is naturally pretty flow and feeble; if the contrary happens it is a disease: In the bloom of age the pulse is naturally hard and full; if the contrary happens it is a disease: However, with relation to this, there are two observations to be made.

1. There are some old men whose pulse is strong and pretty quick, but at the same time hard, and not frisking: It is a natural pulse that indicates the robust constitution they are blessed with: This pulse is likewise called The pulse of long life: But when the pulse of an old man is strong, and likewise at the same time frisking or skipping, and as it were disturbed, all the strength that remains to this man is outward; he has not much within, nor can he last much longer.

2. A man in the flower of his age sometimes has a pulse that is slow and slender, but in a manner gentle and equal, and pretty uniform in the three different places where it is usually felt: This is not much amiss; it is a natural pulse and proper to persons that have been brought up tenderly; but if in the flower of the age the pulse is so fine and slender, that it seems to rise up and grow hard by intervals; if it is not the same at the wrist as at the extremity of the Cubitus, but very different, this pulse is mortal.

There must be respect had to the Constitution and Stature.

In feeling the pulse one ought to have regard to the stature and the corpulence of the subject, and its being naturally more dull or active; if the pulse answers thereto it is good, but if otherwise it is bad.

REMARK.

Neither the text nor the commentary discover in what this correspondence consists.

THE TEXT.

The Complexion of the Patient ought to agree with the Pulse.

If the complexion of the sick person does not quadrate with the pulse it is a bad sign: But there is this observation to be made, That if the colour which according to its kind overpowers the pulse opposite thereto, if the sick person dies it will be suddenly; whereas if the pulse, according to its kind, overpowers the complexion contrary thereto, if the sick person dies it will be after he has lingered for some time.

But if the patient escapes there is this observation to be made, That if it is the pulse which changes and submits to the complexion, the cure will be speedy: On the contrary it will be slow if the complexion changes and becomes agreeable to the pulse while the pulse continues the same; but when once the one and the other quadrate as they ought the danger is over.

When it is known in what noble Part the Disease lies, one may judge by the Patient's Pulse when he will die.

When the distemper is in the liver the pulse is commonly tremulous; but if this tremulousness is hard, strong and quick, like so many repeated strokes of a blade when it is whetted at the place marked for the pulse of the liver, the patient in this case will not live above a day: He will die the next day, betwixt three and seven in the evening.

REMARK.

This place is the joint of the Cubitus with the wrist of the left arm. See the place where the pulses proper to each of the entrails are mentioned.

THE TEXT.

In diseases of the heart the pulse proper to this viscus is overflowing: If you find at the same time the skin leap, like the head of a drum when it is beating, knowing from other signs that the distemper is in the heart, you may be certain that the patient will die the next day between nine in the evening and one in the morning.

When the disease is in the stomach the pulse generally proper to this viscus is feeble: If besides you find the motion like that of water falling drop by drop through a crack, or if without the least frisking or skipping it is flabby, like a small stream of water, the patient will die the next day between one and five in the morning.

When the disease is in the lungs the pulse proper to this viscus is generally sharp and rough; but if you find it mixt with a certain slight short motion, such as is that of the feathers or hairs of animals when they are put in agitation by the wind, the patient will die the next day between nine in the morning and one in the afternoon.

When the disease is in the kidneys the pulse generally belonging to these viscera is hard; but if you find, over and above, that its motion imitates that of the beak of a bird in pecking, the sick person will die the next day between nine and eleven in the morning,

or else between one and three in the afternoon, or between seven and nine in the evening, or between one and three in the morning.

If there are sick persons who, in such like cases, pass the terms that are fixed, they are persons whose stomach is naturally good, and are able to eat to the very last.

That aphorism ought to be rejected that says, any one of the five noble parts being destitute of spirits the person will die at the end of four years.

An ancient book says, that if in the pulse of any person after forty successive beats there is a failure of one, it is a sign that one of the noble parts, called Tfang, is destitute of spirits, and death will follow four years afterwards, when the spring-season shall send forth grass and herbs.

Those who since that time have treated of the pulse unanimously say, that when the pulse beats fifty times successively, without stopping, the person is in perfect health, and his constitution is sound: if after fifty successive beats there is a failure of one it is sign that one of the noble parts is destitute of spirits, and death will follow five years after: Alas! if every thing asserted in these books was to be credited several other things might be mentioned more strange than these.

If the liver is able to perform its functions no longer, death will ensue in eight days; if it is the heart, a day will be the outside; if the lungs one may survive three days, and even to five if it be the stomach; if it be the kidneys, four days is the longest: This is asserted in books to which one may safely give credit.

But when we read that when one of the noble parts, Tfang, is destitute of spirits, death will not follow till four years after, and that in the spring-season: This is not at all credible; common physicians and men of

small understanding usually adhere to books without any discernment, by which they deceive themselves and impose upon the public; I know nothing more contemptible.

REMARK.

I am not able to say to whom this scrap of criticism belongs, it is put into the text with the rest, and consequently is attributed to Ouang tchou ho, who is said to be author of this book: The critic says, very properly, that we ought not to follow every thing that is asserted in books without distinction, not even the most ancient and most valued; and whether he has reason or no to adopt what he has adopted I shall not examine in this place.

I shall only observe that the refutation of the aphorism, which he rejects, supposes that the author of the ancient book has asserted that one may live four years, though one of the noble parts called Tfang was intirely destitute of spirits: This is to take it strictly according to the rigor of the letter; it may be explained more favourably, and the author might only mean that the intermission of one beat at the end of forty was a sign that one of the noble parts, called Tfang, was in an ill state, and scarcely admitted any spirits; inso-much that proceeding still, from bad to worse, death will follow at the end of such a number of years: But to say that this term shall be just four years, and no more, is being too particular; our critic has overlooked this circumstance, for he himself is as exact in his determination, though for a much shorter time, as may be seen in the preceding article.

THE TEXT.

There are occasions, that regard being had to the cause and nature of the disease, will admit of a deviation from the common rules of the pulse.

When the pulse is externally superficial, and easy to be felt when the finger is laid gently on it, it is usual to prescribe a sweat; however there are occasions in which, though the sick person has such a pulse, it will be proper to procure an evacuation by stool.

Tchong king gives us an example; Though the pulse be superficial and high, says he, if the patient feels an oppression at the region of the heart, and a heat in one of the noble parts, named Tfang, let an evacuation be procured by stool, and not by sweat.

There are several other such-like cases, and it is a great error always to follow the common rules relating to the pulse, without regarding the cause and nature of certain particular distempers.

There are also occasions wherein, regard being had to the situation of the pulse, there must be a deviation from the common rules laid down for some diseases.

When the disease is external the common rule is to procure a sweat; but sometimes, according to the indication of the pulse, this rule must be neglected: For instance, says Tchong king, in a pain of the head with heat, if you find that the pulse is more deep than usual, and the pain is in the head only, and not in any other part of the body, there must be provision made for the internal parts, there must be no sweating medicine administered, but a potion called Su nhi, regard being had to the indication of the deep pulse.

Likewise in internal diseases the common method is to give catharticks: However when there is an in-

ternal heat which came on in the afternoon, and the pulse is superficial and empty at the same time, do not purge at all, but procure a sweat, and for that purpose make use of the decoction of the tops of the tree Kouei.

Likewise, when there is a stoppage at the stomach, it is common to give a certain potion which, carrying the humours downward, opens the passages of the breast, and on this account is called a pectoral: However, though there be a stoppage in the stomach or breast, if the pulse is high and superficial, forbear purging, because it will prove mortal.

Likewise, in certain wandering pains throughout the body, it is usual to administer a potion composed of Ma hoang, and the tops of the tree Kouei, by this means a sweat is procured which commonly removes the pains: However, if in these pains you find the pulse at the extremity of the Cubitus evidently slow, take heed of sweating; take special heed to the indication of the pulse, and endeavour to re-establish the spirits and blood which are defective.

An important Observation relating to the Prognosticks of malignant Fevers in the Winter.

Tchong king says, If the pulse be superficial, moveable, strong, hurrying, slippery, it is Yang.

REMARK.

That is, it indicates heat, if not excessive, at least that which is sufficient.

THE TEXT.

A deep, sharp, tremulous weak pulse is Yn.

REMARK.

That is it indicates cold, or at least a defect of heat.

THE TEXT.

If the cause of the distemper is Yn, and the pulse is Yang, if the patient be taken proper care of he will not die: If the cause of the distemper is Yang, and the pulse is Yn, he will certainly die.

This is the most important observation relating to the prognosticks of malignant fevers in the winter, and whoever understands these few words knows more than half of the three hundred and ninety seven methods laid down by some for this purpose.

Of Women's Pulses.

Women have generally a pretty full pulse at the extremity of the Cubitus, but stronger in the right arm than in the left; and if you find in them the pulse of the kidneys it is that of the extremity of the Cubitus, small, sharp, and superficial withal; or if the pulse of the liver, (it is the pulse at the joint of the left wrist) sharp, hurrying, there is an obstruction, and the catamenia are not regular: Likewise when the pulse at the extremity of the Cubitus is slippery and interrupted, or small and slow, the catamenia are not regular, they come but once in the space of three months.

When a woman, who otherwise is in good health,

has a pulse regularly superficial or deep, as it ought to be in the three different places where it is usually felt; in this case if the catamenia fail, it is only when she is with child: Another sign, likewise, is when the pulse at the extremity of the Cubitus is high, and more vigorous than usual.

If the pulse at the extremity of the left Cubitus happens to be overflowing and high, or overflowing and full, she is with child of a son: If at the extremity of the right Cubitus the pulse is overflowing and high, or slippery, she is with child of a daughter.

Others give another rule: When a woman is of a weak and tender constitution, if when the finger is pressed hard upon the pulse of the Cubitus the beats continue to be felt, and she then has not her catamenia, it is because she is pregnant; the same thing may be said of a woman whose catamenia cease, and whose six pulses are in their natural situation, for if it were otherwise she would be sickly.

This is the sense of the ancient book concerning the pulse, that when the pulse is superficial or deep, as it ought to be in the three different places of each arm, and when the finger is pressed upon it the beats still continue to be felt, the woman is with child, and there is no occasion, in judging of it, to have recourse to the difference of the pulses, such as overflowing, slippery, &c.

In the first months of being with child the pulse of the wrist is often small, and that of the Cubitus quick; if in pressing the finger upon it, it seems to disperse, she is three months gone; but if when it is pressed it does not disperse, but keeps its usual consistence, she is five months gone.

When the catamenia cease after a woman has conceived, if then the pulse is long and tremulous her

fruit will not come to maturity, but a false conception will follow.

When in the seventh or eighth month of her pregnancy the pulse is full, hard, and strong, it is a good sign; if it is deep and slender the woman will have a difficult time, and will die in childbed.

The ancient book of the pulse says that when a woman with child, who is otherwise in good health, has a deep pulse, but full in the left arm, she is big with a son; when she has a pulse superficial and high in the right arm, it is a daughter: If the pulse is deep, but full in both arms, she is pregnant with two boys: If the pulse is superficial and high in both arms, she is with two girls: The ancient book of the pulse stops here.

Some of the moderns have prescribed rules to discover if a woman is big with three boys or three girls, or with a boy and a girl: if in observing this rule, they sometimes happen to be right, it is mere accident; but for my part I never follow such absurd whimsies.

REMARK.

Ouang chou ho, who lived under Tsin chi hoang, that famous burner of books, makes mention here of several treatises of the pulse, which at the same time he distinguished into antient and modern: at present Ouang chou ho is himself the most ancient author that we have upon this subject.

If a woman generally has the pulse at the extremity of the Cubitus, small, weak and sharp, the abdomen is generally cold, and subject to violent shiverings, tho' she be ever so young, and she may be certain she will never have a son; but she will have neither son nor daughter, if she is advanced in years.

Of the Pulse of the Heart.

A just discernment and a close attention are necessary in the examination of the pulse, with regard to the heart. If the heart is attacked, and the distemper proceeds from a bad repletion of peccant humours, the patient is troubled with frightful imaginations, and disturbed with monstrous and dreadful figures: if the distemper proceeds from inanition, the patient raves of smoke, fire, light, and such-like things.

When the pulse is quick in the three places where it is commonly felt, (it is only the left arm that is here treated of) the heat is extraordinary in the heart; in this case there generally arise little ulcers on the tongue, and chops on the lips: the patient utters idle things, sees spirits, and, if he was not prevented would drink constantly.

When the pulse of the heart is Kong, that is when it feels like a hole in a flute, having two sensible extremities, and a void place in the middle, there is a loss of blood either by vomiting or urine, and frequently by both.

When the pulse of the wrist of the left hand, called otherwise the pulse of the heart, being thus, flows back, if I may so speak, upon the joint, the whole body is full of pain which seems to pierce to the very bone: the heart perceives a parching heat, causing great anxiety, and the head, especially the face, is all in a flame.

When the pulse of the heart is high and full, it is still a sign of extraordinary heat; the fire with-held and as it were embarrassed, produces wind: these are the parching vapours which occasion pain and anxiety, and

communicate to the face the proper colour of the heart.

There is a defect of heat, and a kind of inanition, when the pulse of the heart is small, the patient being then subject to panick fears, and alternatives of heat and shivering: if the pulse is in a hurry, the entrails are pained, and there is a suppression of urine.

If at the same time it be full and high, and more slippery, there is terror, disorder in the tongue, and difficulty of speaking; if only slippery it is a sign only of simple heat, which has nothing very morbid; but if it is sharp, there is wanting at the heart a proper degree of strength; then there is likewise a difficulty of speaking.

If the pulse of the heart is deep and confined a cold humour is the occasion of the disorder, whence proceeds a Cardialgia; but if the pulse is tremulous, there ensues a palpitation, and a canine appetite.

When the patient has an inflamed visage, an anxious heart affecting to laugh much, there is an excessive heat in the palms of the hands, and a great dryness in the mouth; the pulse likewise agreeable to this state is a pulse confined, full, and inclinable to be quick; if on the contrary it is deep and flabby, the disease is very difficult to heal.

Of the Pulse of the Liver.

R E M A R K.

The pulse proper to the liver is the pulse at the joint of the left wrist, as we mentioned at the beginning.

THE TEXT.

The pulse of the liver in its usual and healthy condition is long and tremulous; when it is superficial and short the liver undergoes an alteration, and one is subject to emotions of anger.

When the pulse of the liver is full one dreams of mountains, trees and forests; when it is empty one dreams of herbs and bushes.

The distemper, called Fei ki, proceeds from an obstruction of the liver; it is a sensible swelling lying under the ribs.

EXPLANATION.

This tumour generally happens in the spring: this distemper commonly has its rise in the lungs; but the liver not being able to get rid of the vitiated humour that it receives, collects it together and forms a tumour; whence often proceeds a troublesome cough, and a quartan ague of a long continuance.

THE TEXT.

When the pulse is long and tremulous in the three places of the left arm, where it is usually felt, the liver is not then in a natural state, but is faulty through excess; upon which is generally felt a pain in the eyes, and large tears are shed by intervals: the patient is fretful, easily provoked, and very subject to be clamorous.

If the pulse of the liver, being soft, inclines never so little to long tremulousness, it presages nothing amiss; but if it inclines to the short tremulous,

there is an alteration in the liver, but not considerable.

If the pulse of the liver, being superficial and strong, is at the same time full, the alteration of the liver is considerable; then generally the eyes are red and full of pain, the patient does not see clear, but imagines his eyes are covered with something that prevents his seeing.

When the pulse of the liver is, as it were, empty in the middle, having two sensible extremities like the hole of a flute, the sight becomes dim, the patient sometimes vomits blood, and the arms and the legs lose their motion.

If the pulse of the liver is sharp or rough there is a wasting of this viscus, and a solution of the blood; the sides are commonly puffed up or swelled, and the swelling is perceived as far as the armpits.

If the pulse of the liver is slippery the liver is too hot, and this heat communicates itself to the head, particularly to the eyes.

The indication is quite otherwise when the pulse is either short and tremulous, or full, or long and tremulous, or deep; then there is an obstruction, and a swelling to be feared: When the pulse is small, weak, superficial, and as it were dispersed, either there is a failure of the spirits, or they have not a free course; then the sight fails, they see, as they commonly say, stars, and they are scarce able to distinguish any thing exactly.

When the pulse is superficial to the last degree the whole body is feeble, and there is a danger of a palsy.

In short, in distempers of the liver the face has generally a blueish cast, there is weakness or pain in the joints, the patient has an angry look, the eyes are often shut, as if unwilling to see any person whatever.

If the pulse of the liver is quick, and likewise long and tremulous, there is still some hope of a cure; but

if when it changes it becomes superficial, and at the same time short and sharp, the distemper is then incurable.

Of the Pulse of the Stomach Pi.

When the stomach is found the pulse proper to this viscus is moderately slow. [It is the pulse at the wrist of the right hand.]

REMARK.

The Chinese distinguish the orifice of the stomach from the stomach itself; they call the first Pi, and the second Ouei; there is nothing to be said to this, but they reckon the first among the five Tfang, and the second one of the six Fou.

This appears contrary to reason, especially if we adhere to the interpretation of some of the moderns, who explain the first character by another which signifies to retain, to shut up; and the second character by another which, according to the same interpreters, signifies gate, passage; for it is plain that the stomach may be said more properly to retain the aliments than the superior orifice.

Thus, according to this interpretation, there is reason to place the stomach among the five Tfang, and the orifice among the six Fou; but let this be as it will, the physicians in their practice and usual way of speaking almost always join the Pi and Ouei.

THE TEXT.

If the motion of the pulse of the stomach resembles that of liquor swallowed without interruption, the stomach has lost its sound and natural constitution.

This may proceed from two different causes, either fullness, upon which they dream of musick and diversions; or inanition, when they dream of feasts.

The stomach dreads moisture very much, and when it suffers by that there is heard a motion in this viscus, and in the intestines, and there ensues one of the five fluxes.

EXPLANATION.

The five fluxes are the flux of the stomach, the flux of its orifice, the flux of the large intestines, the flux of the small intestines, the flux called Ta kia: in the first the aliments are not digested; in the second there is a tension of the belly, in consequence whereof the aliments taken in are returned by the mouth; in the third there is a motion and pain in the entrails, and the stools are of a white colour; in the fourth there is likewise pain in the entrails, but not violent; there comes away blood, and sometimes a purulent matter with the urine; in the fifth there is a strong motion to go to stool, and the patient goes several times to no purpose.

REMARK.

This last is called a Tenesmus in Europe: the commentator calls it Ta kia, a name the origin of which I am unacquainted with: the physicians of the present age generally term it Ge tchang, a name which shews that they ascribe this distemper to too great a heat of the intestines.

THE TEXT.

The stomach is subject to a distemper called Pi ki;

it usually begins in the winter, and it is a defluxion like to a tumour: this distemper, if it be lasting, is followed with a jaundice, and a general falling away of the whole body.

EXPLANATION.

This swelling answers to the pit of the stomach, and appears there oftentimes of the bigness of a small plate turned upside down.

REMARK.

There are small plates in China not above three inches in diameter.

THE TEXT.

If the moderate slowness which agrees to the pulse of the right wrist, proper to the stomach, is like that of the joint at the extremity of the Cubitus of the same right arm, and at the same time the stomach suffers from excess of heat, the mouth then has an ill smell, the patient is subject to troublesome Nauseas, but never vomits; the gums are eaten away, the teeth are left bare, the hair turns dark, cold and heat often succeed by turns, and the strength continually decays.

If the pulse proper to the stomach is full, and at the same time superficial, the digestion is not good; the mouth is generally dry, and tho' the patient eats and drinks never so much he is still weak, and seems to be empty: but if this pulse is only full there is too much heat in the stomach, from whence proceed vapours that produce a stinking breath.

If this pulse is sharp it is to no purpose to eat, for

it does no good, nor does it ever cause the person to thrive.

If the pulse is short and tremulous there is a pain at the stomach, and dolorous shrinkings at the joints; the patient is troubled with continual Nauseas, and has a desire to vomit, but cannot.

If this pulse is long and tremulous there is an excessive heat in the liver, which renders imperfect and spoils the digestion of the stomach.

If the pulse is extraordinary full the patient is troubled with inward pains and dreadful anxieties, as if he were possessed with a demon: but you ought not on this account to have recourse to conjurers and their tricks to dispossess him.

EXPLANATION.

Extinguish, by an evacuation, the too great heat of the heart, and the disease will disappear of itself.

THE TEXT.

In certain diseases of the stomach, which are pretty often accompanied with pains at the joints, wherein the countenance becomes yellow, and the body heavy, there is an indigestion and a diarrhoea: As troublesome as this condition is, if the pulse be deep, moderately flow, slender, fine and small, there is hopes of recovery; but if it is short, tremulous and strong, death is unavoidable.

Of the Pulse of the Lungs.

As the small intestines sympathise with the heart, in like manner the large sympathise with the lungs;

to speak too much and drink too much wine, are hurtful to the lungs; too much speaking often causes a cough, and drinking too freely does the same, whence the face is puffed up or swelled, and even sometimes is full of pimples.

There is a distemper of the lungs called Sië puen; it begins in the spring, and is commonly perceived near the right armpit.

EXPLANATION.

It is a defluxion which forms a swelling at the place mentioned in the text; this tumour sometimes appears as large as a small cup turned upside down.

REMARK.

Those cups which are used in China to drink wine in are very small.

EXPLANATION.

The origin of this distemper is a bad sort of blood sent from the heart: the lungs make an effort to throw it off either to the liver, or back to the heart; but if the lungs, being weaker than these two Viscera, cannot get rid of it, there arises an obstruction and a swelling; if nature or medicines do not quickly disperse it, it will be followed by a fever, which will be hot and cold by fits; and this will be attended with an ulcer of the lungs.

THE TEXT.

When the lungs are found the pulse proper to this

Viscus [which is that at the joint of the right wrist] is superficial, sharp and short; when it is strong, overflowing, long and tremulous, the lungs are not then perfectly sound; if it is disordered by a bad repletion the patient dreams of arms, soldiers, guards and sentinels; if it is by inanition he dreams of marshy lands and difficult roads.

If at the three places of the right arm, where it is usually felt, it is found to be superficial, the lungs have suffered, and do suffer from the air or wind; hence proceeds running at the nose, viscuous spittle mixt at length with Pus; then the patient is afraid of cold, keeps himself as warm as possible, feels a superficial pain almost throughout the body, but especially a dry tension of the forehead, and a painful white in the eyes, from whence proceed tears by fits.

When the pulse proper to the lungs is at the same time superficial and full, the throat becomes dry, and is sometimes inflamed; the body is bound, and the stools are sharp, the nose generally losing the sense of smelling.

But if this pulse is at the same time full and slippery, then the skin and the hair shrink and become withered; the eyes are full of tears, the spittle viscuous, the throat dry and disposed to be inflamed: All this is increased in the autumn, if there is not care taken in the summer; for this purpose bleeding is proper.

REMARK.

The text says that [Pien] a sharp stone is proper; and the commentator, enlarging a little upon the text, says in such a case it is necessary in the summer to use a sharp stone to evacuate what the heart has too much of, that is the excessive heat that it has; for according

to what is said elsewhere the heart, among the five Tfang, answers to fire among the five elements.

From this place alone it is clear that bloodletting was known to the Chinese a long time ago, as a means to prevent the bad consequences of an excess of heat, and it is actually used in China very frequently for horses and asses.

With respect to men it is frequently practised, but commonly in a manner which can have no great effect, the orifice is so small, and the quantity of blood taken away is so little; generally speaking it is but the third of a porringer, and sometimes less; it must likewise be owned that the frugality of the Chinese, and the lightness of their nourishment, makes this remedy less necessary than in Europe.

However there are occasions wherein the Chinese look upon it as the only remedy, and at the same time an infallible one: A man is sometimes seized with a kind of a fit of the gravel, which causes insupportable pains; he cries out aloud, but his voice is soon interrupted by the violence of the distemper, the eyes are distorted, the visage becomes livid, the extreme parts are cold, and the patient is almost at his last gasp.

The Chinese commonly attribute this disease to the gravel, without determining where it resides: A christian of the age of twenty-five was one evening seized with this distemper; they could not come to give me notice of the danger he was in, because his house was in the suburbs, and the gates of the city were shut: every one said, when they saw the patient, that his distemper was the gravel, and that it was necessary to send for a person to bleed him; this person was neither physician nor surgeon, however, being sent for he came, tied the patient's arm above the elbow, washed and rubbed the arm under the ligature, and then with a lancet,

made upon the spot with a bit of broken china, he opened the vein in the usual place, that is at the bending of the arm; the blood spurted out very high, upon which the ligature was untied, and the blood suffered to run and stop of itself, and they did not so much as bind up the wound: I was informed that instead of binding up the orifice made by the lancet, they generally apply a grain of salt; the patient was cured, and the next day in the evening he came to the church.

I was curious to see the place where he was let blood, and I found it to be the same where it is generally done by the Europeans; the orifice was already almost entirely healed, being but very small at first; the christians assured me that the quantity of blood would fill two cups, such as they usually drink tea out of.

THE TEXT.

If the pulse proper to the lungs is deep, short and tremulous, and inclinable to be slippery at the same time, it is a certain sign of a cough.

EXPLANATION.

This cough proceeds from cold.

THE TEXT.

If the pulse being small, superficial, and is at the same time as it were dispersed, then the lungs are as they ought to be; it is in its natural and sound state.

REMARK.

The commentator expresses the character of this pulse, mixt with the three expressed in the text, by the comparifon of the motion which is made by a heap of feathers when it is blown upon by a fmall wind.

THE TEXT.

But if the pulse proper to the lungs is at the fame time fuperficial and overflowing, the breaft is oppreffed with fome defluxion, and there is at the fame time a motion in the large intefines.

If the pulse be long and tremulous the cold has caufed ventofities in the breaft, which is commonly accompanied with a conftipation.

If the pulse feems to be empty in the middle, like a hole in a flute when the finger is laid upon it, there is a hemorrhagy, and diffipation of the fpirits.

If the pulse is deep, flender, and inclinable to be flippery, the bones are as it were ftewed in Balneo Mariæ; the fkin and the hair become rough, and there is a fucceffion of heat and cold.

In fhort when a man who has diftempered lungs fpits blood, or bleeds at the nofe, coughs violently by intervals, is melancholy and full of complaints; if the pulse in fuch a cafe is fuperficial, and never fo little fharp, the fign is not quite fo bad, nor is the difeafe abfolutely incurable; but if it is overflowing, ftrong, and bordering upon the hard, there is no poffibility of a cure.

Of the Pulse of the Kidneys.

If the pulse proper to the kidneys be deep and slippery in the winter it is in its natural state.

REMARK.

The pulse at the extremity of the cubitus of the right arm has reference to the right kidney, and the same in the left arm to the left kidney: here the text speaks of both confusedly.

THE TEXT.

If the pulse is superficial and slow the kidneys are disordered, and the cause of the distemper is in the stomach.

It happens thro' cold that some persons are always spitting, and this draws off the humidity necessary for the kidneys, from whence ensues a troublesome dryness.

There is a distemper called Puen tun, a kind of tumour or swelling which is perceived in the umbilical region, the cause whereof is an obstruction, and which commonly ends in a universal palsy.

When the kidneys are in a diseased state, if it happens thro' repletion, there is perceived a weight in the region of the loins, especially in the night when the person comes to lie down; if it is caused by inanition or weakness, the urine is apt to come away insensibly when the person is asleep.

If at the three places where the pulse is usually felt it is found to be sluggish, the kidneys are disordered with cold, and there is heat and roughness in the skin;

the patient when asleep often dreams that he is falling into the water, and when he is awake is thoughtful, anxious and melancholy.

If the pulse proper to the kidneys seems to be dispersed, or if the person makes water too often, or too plentifully, or if there is a simple gonorrhœa, then there is a pain in the region of the loins, and in the knees; there even sometimes arise sudden and cold sweats without any apparent cause: In short the pulse above mentioned is so much the worse, if it does not exactly indicate any of these distempers in particular.

If the pulse proper to the kidneys is full and slippery, it is an infallible sign of a dysury or difficulty of making water; the urine is reddish and very hot.

If the pulse be sharp it is a sign of a troublesome gonorrhœa, the patient is subject to a thousand extravagant dreams, especially often imagining himself to be walking over great waters; besides there frequently happens a swelling in the scrotum and the right testicle.

If the pulse is at the same time full and strong there is a heat in the bladder, whence ensues a suppression of urine, or at least a difficulty of making water.

If the pulse is at the same time slippery, tremulous and long, or else deep, short and tremulous, in both these cases there is a pain in the loins, and a swelling in the feet; but in these two cases the cause of the pain is not entirely the same.

EXPLANATION.

In the first case the pain is caused by humid winds, but hot withal; in the second case by cold winds.

THE TEXT.

When the pulse proper to the kidneys is superficial, short and tremulous, the alteration in the kidneys is perceived in the ears, for they become deaf.

When the kidneys are so affected that the countenance becomes livid, and the cold seizes the legs and feet, the disease is very dangerous; however if the pulse is then deep, slippery, and inclinable to be long and tremulous, the distemper is not incurable; but if the pulse be then slow and strong, there is little hope left.

General Observations on the Pulse wherever it is felt.

1. In whatever arm and place the pulse is felt there ought to be regard had to the season.

2. The pulse of a healthy person beats at least forty five times successively, without any inconsiderable intermission.

3. When the pulse is perceived under the fingers to be long and tremulous, or in a hurry, or overflowing, or short and tremulous, one may judge in general that there is an excess of heat and ventosities.

4. When the pulse becomes deep and slender all of a sudden, and as it were by stealth, the cause of the disease is cold, and it preys upon the spirits.

5. When the pulse imitates the motion of water that falls drop by drop through a crack in the cieling, or the motion of a bird's beak when it pecks any thing, we may judge that the disease is incurable.

Observations on the Pulse of the left Wrist, which is proper to the Heart.

1. It is no very dangerous matter, if after forty-five usual beats it alters or ceases, for a short time only.

2. If it sinks after thirty-one, and is very backward in returning to its first state, if it be the spring-season in which this happens, the patient will die the following summer; the same may be said in proportion with regard to the other seasons.

Observations upon the Pulse of the Joint of the left Wrist, the Pulse proper to the Liver.

1. If the pulse beats fifty times in the usual manner, or at least forty five times, without any remarkable interruption, nothing ails the liver.

2. There are violent heats and ventosities in the liver, if after twenty-six beats it sinks and becomes deep, but soon returns to its former state.

3. If it becomes sharp, and seems to conceal itself, after twenty-nine proper beats, there is a great obstruction, and the liver is in a bad state; the joints of the body are affected with it, and it commonly proceeds from bad to worse till it ends in death.

4. If it sinks, rises, then sinks again, after nineteen beats, the liver is quite spoiled, and is unable to perform its functions; in which case all human aid is vain.

Observations upon the Pulse of the Extremity of the left Cubitus, the Pulse proper to the left Kidney.

1. The kidney is found if there be forty-five proper beats without intermission.

2. The kidney is hurt by wind or heat, if it seems to be in a hurry, or long and tremulous, when pressed by the finger.

3. If it suddenly becomes very flow, the disease is extremely dangerous, and requires immediate assistance: cold is frequently the occasion of this, and will require much trouble and expence to get rid of it.

4. The kidneys are depraved, and unable to perform their functions, if after twenty-five proper beats it sinks; all the physician's skill will not be able to save the patient, and the most that can be expected is a reprieve, which cannot be of long duration.

Observations upon the Pulse of the right Wrist, which is proper to the Lungs.

1. If there are forty-five proper beats without intermission, the lungs are found.

2. If this pulse is in a great hurry, the external air has disordered the lungs.

3. If when you continue to count the beats, and observe the pulse, you find it becomes considerably flow after twenty beats, the lungs are void of the necessary degree of heat; do not look upon this as a trifling matter, but get a cure as soon as possible; without which you will find that the pulse will sink, and sink again, and the feeble patient will in a short time not be able to quit his bed, the lungs being unable to perform their function.

4. If it disappears after twelve beats of the pulse, or undergoes any remarkable change, the patient will soon be plagued with a troublesome cough, accompanied or followed with spitting purulent matter; his strength will fail, his hair decay, and he will not live long.

Observations on the Pulse at the Joint of the right Wrist, which is proper to the Stomach.

1. If the pulse beats forty-five times in a proper manner, without intermission, the stomach is sound.

2. If the pulse falls into a great hurry, the excess of heat in the stomach will disturb the concoction of the food.

3. However, this viscus generally suffers through defect of heat, which will appear from the extreme slowness of the pulse.

There are nauseas and vomitings when it is in this condition, which frequently happens, and the sick person cannot live more than ten days.

Observations on the Pulse at the extremity of the right Cubitus, which is proper to the right Kidney.

1. If during forty-five proper beats there happens no intermission, this viscus is sound.

2. If it sinks after nineteen healthy beats, then rises and sinks again, it is a certain sign of death, very few escaping.

3. If this pulse is strong, hurrying, and inclinable to be tremulous, the viscus is disordered with ventosities, which proper medicines will cure.

4. If the pulse sinks after seven agreeable beats, ri-

ses and sinks again, without rising till some time after, the patient will not live long.

Observations upon the seven Pulses called Piao, that is the external and more sensible in comparison of the rest.

Upon the Pulse called [Feou] superficial, and its various Indications.

1. The superficial pulse is that which when pressed hard by the finger is not felt at all, or but very little, and which on the contrary is very sensible when gently pressed.

2. In general when the pulse is superficial at times and places when it should not be so, as has been already explained, there is either a cough or difficulty of breathing, or cold sweats, or lassitude and weight in the loins, or unquiet sleep, or else a complication of all these symptoms.

3. When upon pressing with the finger the pulse becomes very little sensible, and then upon feeling exceedingly lightly it becomes very sensible, and if upon repeating this twice the same thing happens exactly, then the blood is too hot, and yet the noble parts have not that degree of heat that they require. This must be cured by restoring the spirits, and reducing the heat and cold to a just temperature.

4. When the pulse is superficial both in the right and left wrist, the patient is disordered by the external ira, and there is pain and heat in the head.

5. If this pulse is the same at the joints of the wrist, the stomach is as it were exhausted, and a swelling, or at least a tension of the body ensues.

6. If it is the same at the extremity of the Cubitus,

the lungs have been hurt by the wind or air, whereupon there ensues dryness or roughness in the great intestines, and of course a constipation.

Of the Pulse called Kong, and its Indications.

1. The second of the pulses, called Piao, is the Kong; it yields a sensation under the finger like that of a hole of a flute, leaving an empty space between two extremities; this pulse appearing at a time, and in places not agreeable to its nature, generally indicates a tension of the small intestines, a constant desire to make water, and yet making drop by drop with pain; however, these diseases may be cured by proper medicines.

2. If this pulse is perceived at the wrist there is an obstruction, stoppage, and perhaps a defluxion in the breast.

3. If the pulse is found at the joints of the wrist, it indicates an abscess in the intestines.

4. If it is found at the extremity of the Cubitus, there is an inanition in the kidneys, a sharp blood is secreted by the urinary passages, or even thick purulent matter.

Of the Pulse called Hoa, and its Indications.

1. If under the finger somewhat like a pearl be perceived in the places where the pulse is commonly felt, and if when pressing a little harder it sinks without going backward or forward, this kind of pulse is called slippery: when it is found at the three places usually felt, the kidneys are disordered, there is a tension in the small intestines, a weakness in the whole body, and hot and cold fits by turns, the urine is sharp and

reddish, all which proceeds from too much heat: The cure is performed by a mitigation of the heat, in which if you succeed these disorders cease.

2. This pulse indicates frequent nauseas, when it is only found at both wrists.

3. The stomach is cold, and unable to digest the aliments, when it is the same at both joints.

4. When it is found at the extremity of the Cubitus, the belly in the umbilical region is as cold as ice, and in a condition which, according to the commentator, makes the patient thirsty, and yet he never drinks, but a grumbling is heard in the bowels.

Of the Pulse called [Che] full, and its Indications.

1. The fourth of the external pulses is said to be full: It differs from the superficial in that being pressed hard it still continues to be sensible, though it is more so when but slightly pressed.

2. If this pulse is found the same in the three usual places of feeling it in each arm, it indicates violent internal heat, which causes inanition in the stomach and its orifice, and though the patient eats sufficient y he still feels a lassitude and lowness of spirits; in this case he must use temperate cordials, which are neither too hot nor too cold.

3. There is an excess of heat in the breast, when this pulse is found in the wrist at improper times.

4. If it is found at the joints of the wrist there is a pain in the hypochondria, and the second of the three Tiao, or stoves, is in disorder.

5. If it is found at the extremity of the Cubitus, and feels under the finger like a cord, it indicates a swelling in the belly and a dysury.

Of the Pulse called [Hien] long and tremulous, and its Indications.

1. The fifth pulse of the Piao, or external, is called long and tremulous: It has this in common with the superficial, that when it is pressed hard with the finger it is scarcely sensible, whereas when the finger is laid on gently it is as sensible as the rest; but it differs from the merely superficial in that there is observed in it every now and then a kind of inequality or trembling, much like that of the strings of the instrument called Tseng.

2. If at the three places where the pulse in each arm is felt this sort of pulse is found, it indicates spontaneous sweats, lowness of spirit, and forebodes a consumption; the hands and the feet seem as if they were benumbed, and are sometimes full of pain; the skin likewise feels dry: The indication of cure in this case is to maintain the natural heat in the Tan tien; [this, says the commentator, is three inches below the navel.]

3. There is a sharp pain in the region of the breast, if this pulse is found in the wrists; the stomach is affected with cold, if it is found at the joints, and the natural heat of the lowest stove [Tsiao] is as it were extinguished by the waters which stagnate in the region of the abdomen.

Of the Pulse [Kin,] short and tremulous, and its Indications.

1. The sixth part of the external [Piao] is called short and tremulous, it is something of the nature of the superficial and overflowing; it has however this

proper to itself, that when the finger is pressed hard it is still sensibly felt, but in laying on the finger lightly there is a considerable acceleration perceived.

2. When in those places, where the pulse is usually felt, it is found as has been described, there are malignant vapours put in motion by internal heat, and madness is near at hand; if it has not yet appeared it will soon discover itself by extravagant words, songs, and irregular motions, and unless a skilful physician be called in there is no hopes of a cure.

3. The head is only pained, if this pulse is found no where but at the wrists.

4. If it is only at the joints the pain is perceived, and increases, by degrees, at the region of the thorax.

5. If this pulse is at the extremity of the Cubitus, the abdomen is pained, and so violently, that the patient keeps his hand there continually.

Of the overflowing Pulse [Hong,] and its Indications.

1. The seventh and last of the pulses, called Pia, external and more sensible, is the overflowing; it is always found to be very sensible though pressed ever so hard, though it is more so when it is touched but gently.

2. When this pulse is found at the three usual places of the left arm, there is a superficial heat throughout the body, dryness of the large intestines, constipation, thirst, uneasy pain throughout the body.

3. If this pulse is predominant in the middle of the summer it indicates excess of heat, but not in the least dangerous, for it will grow temperate of itself; but if it is in the middle of the autumn, or in winter, the distemper requires a remedy: the patient ought first of

all to have a sweat, and then, after taking a laxative medicine, the excess of heat will cease.

4. If this pulse is only at the wrists the excess of heat is in the upper parts, from the head to the breast.

5. If this pulse is only at the joints, the stomach is overloaded, and a nausea and vomiting succeeds.

6. If this pulse is only at the extremity of the Cubitus, the heat is in the small intestines, which is communicated to the kidneys; the urine is sharp and reddish, and there is a great heaviness in the legs.

Observations on the eight Pulses called Li, more internal and less sensible.

Upon the Pulse called [Ouei,] small, and its Indications.

1. This pulse is the first of the eight Li: It is distinguished by pressing moderately when the beating is discovered, but is very small; then pressing somewhat harder a second time it is still perceivable, but so small, that it can hardly be called a pulse.

2. The spirits are greatly exhausted, if it is found in the three usual places of each arm; and when it continues so long, it is followed by a simple gonorrhoea, the face becomes livid, and in a short time the bones grow entirely dry.

3. A malignant humour attacks the head and the breast, if this pulse is found at the wrists.

4. No other part but the heart is attacked, if it is only at the joints.

5. If it is at the extremity of the Cubitus only, the malignant humour has its seat in the abdomen: The patient perceives a kind of shivering throughout the body, and there is a grumbling of the intestines when he drinks.

Of the deep Pulse [Tchin,] and its Indications.

1. The second of the eight pulses, called Li, is deep or profound, and is known by this mark, that if you press very hard it becomes sensible, but slow and loose like a piece of worn-out stuff; and if the finger does not press hard it is not perceived at all.

2. If this pulse is found at the three usual places in each arm, it is a sign of a swelling or oppression in the region of the arm-pits, and of cold at the extremities of the body; the noble parts are exhausted, and the natural heat of the three stoves are not communicated as they ought, which occasions obstructions.

3. The breast is loaded with phlegm, when this pulse is only at the wrists.

4. If it is only at the joints, there is an oppression, and a lively pain from the breast to the navel, with a great difficulty of breathing, which is sometimes like to stifle the patient.

5. If this pulse is only at the extremity of the Cubitus, there seems to be a weight in the loins and legs, and the urine sometimes becomes thick, and sometimes black.

Of the Pulse [Ouan,] moderately slow, and its Indications.

1. The third of the internal pulses called [Li,] less sensible, is the moderately slow: The only difference between this and the sluggish lies in the degree; the slow pulse generally indicates lowness of spirits and lassitude, accompanied with anxiety, which shews that the motion of the spirits is not free.

2. When this pulse is found at the three usual pla-

ces of each arm, the kidneys are affected; there is a viscous humour, and a malignant vapour extends itself to the head, and especially to the ears, which then are troubled with a prodigious humming. The pains will cease, if you make an aperture with a needle behind the head overagainst the lower part of the brain, and repeat it thrice.

3. The joints are pained, if this pulse is found at the wrist.

4. There is a difficulty of standing upright, if it is felt only at the joint of the wrist, for the great pain renders the body crooked.

5. When it is found only at the extremity of the Cubitus, and is at the same time slow and inclinable to be small, there is an obstruction caused by cold humours, the patient's sleep is disturbed in the night-time, and he imagines himself tormented by spectres.

Of the Pulse [Sæ,] sharp, and its Indications.

1. This is the fourth of the eighth called [Li,] the more internal and less sensible: It is necessary to press hard to perceive it, and its motion has something like that of a knife-blade scraping a bamboo. When this pulse is found at improper times, if the patient be a man, it indicates a Virus; if it be a woman with child her fruit will be disordered, and she herself will be perhaps intirely carried off: If a woman not with child has this pulse, it indicates a corruption infecting the mass of blood.

2. The stomach is very weak, if this pulse is only found at the wrists.

3. The blood is spoiled, and unfit to nourish the noble parts, if it be at the joints of the wrist.

4. If it be only at the extremity of the Cubitus,

there is a malignant sweat over the whole body, and frequent dejections of the fæces.

Of the Pulse [Tchi,] sluggish, and its Indications.

1. This pulse is the fifth of the eight Li, the more internal and less sensible; besides that it requires pressing hard to find it, its characteristic is a great slowness of motion, insomuch that in a space of inspiration and expiration there are but three heats; this indicates a general inanition in the kidneys.

2. If this pulse is inclinable to the following pulse, called Flying downwards, the disease will not be easily cured; but if this is met with in the summer, it is still worse, and the disease is as it were incurable.

3. The heart is disordered with cold, if this pulse is found at the wrists.

4. The belly is pained, and liquids do not pass easily, if it is at the joints of the wrist.

5. If it be at the extremity of the Cubitus, there is a coldness and weight in the loins and feet, and it is in vain to cover them, for they cannot be kept warm.

Of the Pulse [Fou,] flying downwards, and its Indications.

1. This pulse is the sixth of the Li, and seems when felt to fly away and hide itself, becoming insensible for a moment; then if you press anew with the fingers, and still harder, it is met with again, and does not vanish, but is low and deep; if it is found at the three usual places it indicates occult poison and concealed malignity, the body is weakened, and the extremities are cold; there is an internal pain, and a secret poison disturbs the temperament of the blood and spirits; in

whatever season this is found it is necessary to procure a speedy sweat, and from thence to begin the cure of the disease.

2. There is an obstruction in the breast, if this pulse is only at the wrist.

3. There is an obstruction in the intestines, which affects the eyes, if it is found only at the joints of the wrist.

EXPLANATION.

This is true, if it be at the joint of the left wrist; but if it be at the right wrist it is the stomach that is disordered, and the disease called the piles soon follows.

THE TEXT.

4. If the pulse is only met with at the extremity of the Cubitus, there is a want of digestion, and the patient cannot rest sitting or lying; it is besides attended with a diarrhœa.

Of the Pulse [Siu,] moist or liquid, and its Indications.

1. The seventh of the eight Li is moist or liquid, and seems like water pressed under the finger. It is generally accompanied with troublesome heat, a severe pain in the head, a great noise in the ears, and an external cold in the privities. All these troublesome accidents proceed from things still more troublesome, the brain and the marrow of the back are dried up, and likewise the *Vesiculæ Seminales*: A malignant fermentation boils, if I may so speak, the bones in *Balneo Mariæ*; the five Tfang are soon after disordered, and death is not long in following.

2. The feet are subject to sweat, if this pulse is met with only at the wrist.

3. If at the joints of the wrists, the spirits fail, and there is a barrenness, or a disposition thereto.

4. If at the extremity of the Cubitus it is at the same time slender like a hair, there is a malignant cold throughout the body; the flesh and the bones are ready to separate, and do not any longer support each other.

Of the Pulse [Yo,] weak, and its Indications.

1. This pulse is the eighth of the Li, and is compared to the sensation caused by a bit of old cotton, having this common with the rest, that after it is discovered, and is strongly pressed, it disappears; besides, its motion is slow, and commonly embarrassed.

2. If it be found such at the three places where it is usually felt, it is a sign of malignant and excessive ventosities: If it be found in a young man, he will presently die, and if in an old man he may be cured.

3. There is an inanition, if the pulse is only at the wrist.

4. There is a difficulty of respiration, if it be only at the joints of the wrist.

5. The blood is spoiled, if it is only at the extremity of the Cubitus: There is an internal pain which is soon felt outwardly, and the patient generally dies of it.

Observations on the nine Pulses called Tao, and their Indications.

R E M A R K.

Tao signifies, among other things, fashion, manner,

road, &c. Perhaps the intention is here to examine the nine manners, or nine properties, which may be indifferently found in the more and less sensible pulses.

THE TEXT.

The first of these nine pulses is called [Tchang,] long; that is when the three fingers being applied to the three usual places, it seems to be one continued pulse, the pulse of the extremity of the Cubitus passing beyond its usual bounds, as also that of the joint: This pulse in general indicates excessive heat and anxiety, both when sleeping and waking. The poison or malignity of the heart is communicated to the noble parts, and arises from the intemperies of the three stoves; this ought to be dissipated by sweating.

The second of these pulses is called [Toan,] short, that is when the three pulses do not exactly fill their usual places: This indicates inanition, whence proceed malignant shiverings, cold humours in the belly, which prevent the natural heat from spreading as it ought, and keeps it as it were in prison, whence proceed very imperfect digestions; the method of cure is to evacuate these humours.

The third of these pulses is called [Hiu,] empty, or exhausted: This is when the fingers are pressed hard or are laid on gently, the pulse seems insufficient, and as it were empty or exhausted: It indicates great weakness, fears, fainting fits, a disposition to be epileptick, especially in children; but in whatever person it is found, if it is in the three usual places, the blood cannot attain the necessary perfection for the nourishment of the internal and more essential parts of the body, which, wanting their necessary support, undergo malignant and troublesome fermentations. The

method of cure is to establish, if it be possible, or at least to sustain the natural heat of the three stoves.

The fourth is the pulse called [Tfou,] the confined: This is, when pressed by the three fingers it seems in a hurry, but stops as it were at the wrist in such a manner that it omits, through precipitation, a single beat, and then begins again: This pulse presages a dangerous event; if it changes soon for the better, the patient may recover; but if it continues in this condition death is at hand; at least there is no human remedy to be found.

The fifth is the pulse called [Kie,] embarrassed: That is when the pulse is moderately slow, fails in one beat, then returns again with an irregular impetuosity, as if it could not have proceeded without stopping, if I may so speak, to take breath, and disentangle itself, it indicates an obstruction in the region of the stomach, whence follows a weight and numbness of all the limbs, and frequently a severe cholick. An excess of heat in the three stoves occasions this distemper; correct these intemperies gently, and the patient will soon be cured.

The sixth is called Tai, which signifies succession, change of generation, &c. This is when the pulse is felt to be irregular under the fingers, and then suddenly rises, and seems to move back instead of proceeding forward: When this is the case, the face becomes livid and sickly, the patient is unable to speak because the vital spirits are almost entirely exhausted; a malignant air has quite dispersed them; the soul, adds the commentator, has no longer any place to lodge in.

The seventh is called [Lao,] hard; that is when it cannot be felt with a gentle pressure, but is discovered afterwards by pressing hard, but so irregular and indi-

stinct that it seems sometimes to incline to the deep, and flying sometimes to the full and long; sometimes to the small, but tremulous at the same time, always retaining a certain tension or hardness, which is its proper characteristick.

REMARK.

Sometimes this is called Ke, and is compared to the sensation which arises from the head of a drum when it is touched.

THE TEXT.

It indicates an internal plethora kept in by the troublesome impression of external cold on the outward parts, which were too much exhausted to resist it, whence proceed internal pains as in the bones: Soon after the skin changes colour, and a difficulty of breathing ensues; at length a continual oppression in the breast, caused by the combat of the internal heat and external moisture. All medicines in this case are to no purpose, and the patient will certainly die.

The eighth is the pulse called [Tong,] moveable, not that it has any great motion, but because it yields a sensation under the fingers somewhat resembling that of smooth stones when they are felt under the water: This pulse is not discovered but by pressing hard, upon which it resists the fingers a little, and when you repeat the feeling of it two or three times it seems to beat without pressing forward, as if it was fixed in the same place: This indicates a weak exhausted body; there ensues a flux and loss of blood of long duration, especially in women; and if the patient does not meet with a very skilful physician he falls into a consumption of the lungs, and dies soon after.

The ninth is the pulse [Sie,] fine, slender, which is when it seems under the fingers like a very fine hair: This shews an accidental cooling of the brain and spinal marrow: The body is feeble, and the legs seem to be asleep; there sometimes happens a troublesome gonorrhœa of the simple kind; the face changes colour, and becomes meagre; the hair on the head and body decay and perish; and this distemper begins towards the latter end of winter, which frequently disappears in the following spring without any medicines being taken by the patient.

THE TEXT.

Every thing relating to the heart, the liver, and the left kidney, is examined from the pulse of the wrist, the joint, and the extremity of the Cubitus of the left arm: They examine what regards the lungs, stomach, and right kidney, or the gate of life, in the same places of the right arm, and in the same order.

This is the correspondence of the five Tfang, and the six Fou: The heart, which is the first of the five Tfang, and the small intestines of the six Fou, have a correspondence with each other: There is also another between the liver one of the five Tfang, and the bladder of the liver one of the six Fou: Likewise between the stomach one of the five Tfang, and the ventricle one of the six Fou, to which it is contiguous: In like manner between the left kidney and the bladder, the right kidney and the three stoves, and between the lungs and large intestines.

The pulse is generally felt in three places of each arm; at each of these places it may be distinguished into superficial, deep and mean, which yield nine different combinations in each arm; but the mean or

middle pulse is that which ought to direct the judgment, with respect to the rest.

He should be in perfect calmness, both in body and mind, who feels the pulse: He ought to be also very attentive, without allowing his thoughts to stray, and even the motion of the systole and diastole ought in himself to be regular and just; then applying the fingers gently to the skin, without pressing, he is to examine what relates to the *six Fou*; then pressing a little harder, but not so as to feel the bone, he is to examine if he finds the pulse that he feels in a just moderation; then pressing harder, so as to feel the bones of the arm, he must examine the pulses of the five *Tfang*; afterwards he is to examine whether the pulse has any intermission or not, if it be quick or slow, and how often it beats in the space of inspiration and expiration.

If the pulse beats fifty times successively, without any interruption, this is health; if it stops before it has beaten fifty times, this is a disease; and the distemper is judged more or less dangerous, according to the number of beats before it stops.

If the pulse stops at the end of forty beats, one of the five *Tfang* is spoiled: Those to whom this happens very rarely live more than four years; if the pulse stops after thirty beats, then three years is the longest period; if the pulse stops at the end of twenty beats the patient cannot live more than two; but if it stops sooner than this it is still worse, and is a sign of a dangerous distemper.

But though in this last case there be great danger, yet it is sometimes more and sometimes less: For example, the patient generally dies in three or four days, if the pulse stops after two beats; if the pulse stops after three beats, the patient may live six or seven days, if the pulse stops after three beats; and

the patient generally lives eight days, if the pulse does not stop till after four successive beats, and so of the rest in proportion.

The prognosticks of the pulse are likewise founded upon its opposition to the present state of the health of the person at the time of feeling; for instance, a man may feel no disorder, and even appear to be strong and healthy, and yet have the pulse of a sick person, that is superficial, short and tremulous, and according to the commentator be walking hastily toward the grave: He adds, that in a short time he will fall sick, and very probably die.

Likewise if when the pulse of a man who is really sick is felt, you find it like that of a robust person strong and overflowing, he will not live long.

Fat people commonly have the pulse deep, and a little embarrassed, but lean persons on the contrary long and superficial: In short people it is confined, and, and as is were pressed; but in tall people it is somewhat loose.

Of the Distemper called Chang han.

REMARK.

Chang signifies to wound, to hurt; and Han, cold; as if one should say a malignant and dangerous cold: This distemper is very frequent in China; it is a malignant fever, which they call Chang han in winter, and which has different names for the various seasons of the year.

THE TEXT.

In this disease, notwithstanding the name that it bears, the physician in feeling the pulse, and in judging of its indications, should follow the same rule as

in distempers occasioned by heat: Thus in the disease called Chang han, the pulse is at first superficial, short and tremulous, and becomes by degrees strong and overflowing, and is perceived to be so in the three usual places of feeling, it is a good sign; the malignity seems ready to be dissipated, and the patient is generally out of danger in seven days time.

But if on the contrary the pulse is small, slow, and yet a little frisking at times, and then as it were flying downwards, the patient is in a dangerous situation. When this is the case, there must be an exact knowledge gained of the hour and day that the distemper began, that its progress may be judged of by examining carefully the changes that happen to the pulse, either with regard to its height or smallness, or to the swiftness or slowness of its motions.

Generally speaking in the distemper Chang han, as in those proceeding from heat, the pulse ought to be high and overflowing; and when it is small, slender, and almost imperceptible, all endeavours to recover the patient are in vain.

When after sweating, which is to be procured at the beginning of the distemper, the pulse becomes tranquil, and the fever abates, all goes well: But if after sweating the heat and anxiety continue, and the pulse is as irregular as before, there is not the least hopes of his recovery.

There are diseases (malignant fevers,) caused by a poison or malignant hot ferment in the blood; and there are others which proceed from a poison of a cold nature: These are the different diagnosticks and prognosticks; the patient appears to be strong, is troubled with unquiet, violent, and convulsive motions; the face becomes red, and red spots appear in other parts; the patient grows delirious, and while he is

so says many extravagant things, and sometimes imagines he beholds ghosts. These accidents are commonly accompanied with a perpetual looseness, and sometimes with profuse sweats; the patient frequently opens his mouth in such a surprising manner, that one would imagine he was just at the last gasp. However dangerous his condition seems to be, let him not be given over, but make use of harmless medicines that are proper to his distemper; if he gets over the seventh day, there is no fear of his recovery.

There is a weight over the whole body, when the poison is of a cold nature; the back is stiff, the patient feels dreadful pains in his eyes and abdomen; the lips are of a dusky blue; the heart is seized with a malignant poison, which it cannot expel; the extremities of the body become cold; there is a nausea, a diarrhoea, and rattling in the throat, and the pulse is commonly deep and slender: The best thing that can be done in this dangerous extremity is to endeavour speedily to maintain the natural heat three inches under the navel; if the patient gets over six days, he will presently recover.

The Prognosticks of several Diseases by the Pulse.

In the swelling of the belly, if the pulse is high and strong the distemper will disappear, but if it be empty and small the danger is great, and it requires much judgment and attention to make a successful cure.

A small pulse is good in dysenteries, but a strong and overflowing one very bad.

A strong and full pulse is good in ravings and madness; but it is a very bad sign, if it be found deep and slender in the three usual places: It is beyond the skill of any physician to cure such a distemper.

In the distemper called (Siao ko,) continual thirst, the pulse quick and strong is good; but if it be small and empty it is dangerous, and cannot be easily cured.

In the watry dropsy, when the pulse is strong and high, if the disease will not yield to medicines, yet the patient will live a good while; but if the pulse is small, and scarcely sensible, the patient will soon die.

After the accidents of the distemper called Kio loan, if the pulse is small and very slow there is a failure of the spirits, the patient is very low, and neither can nor will speak a word. When this is the case, the distemper cannot be easily cured; on the contrary, if the pulse is high and overflowing, the cure is easy, according to the experience of all ages.

EXPLANATION.

The distemper Kio loan is a confusion, and a war between heat and cold in the intestines; this confusion is occasioned either by some irregularity in eating and drinking, such as a debauch with wine, an excess of cold and raw food, or else a cold taken by sleeping on the ground, and being exposed to too great a wind, &c.

When the accidents of this disease begin by a pain at the heart, a vomiting soon after follows; when the pain first appears in the intestines, it is succeeded by a diarrhoea, and as the pain at the heart, and in the belly sometimes begin together, then there follows a purging both upwards and downwards. The pulse is very irregular, variable, and yet inclinable to that called the flying downward, during the time of these accidents and violent pains.

The most violent accidents being over, if the pulse

is strong and overflowing, the disease may be easily cured; but it is very dangerous, and difficult to cure, if it be slow, small and slender.

THE TEXT.

A deep and slender pulse is good in fluxes of blood, whether by the nose or mouth: A high, strong, and tremulous pulse shews that the danger is great; but if it is hard withal, the patient will certainly die.

A deep and heavy pulse is good in cardialgias and cholicks; but a high tremulous and strong one is mortal.

EXPLANATION.

The cardialgias or cholicks may proceed from very different causes, and the above rule is not infallible.

THE TEXT.

There are various kinds of epilepsies, but it may be said in general, that a slow and superficial pulse is proper to this distemper; a confined, full, strong, and hurrying pulse is a very bad sign, especially if the epilepsy is of this kind that the patient, whether he will or not, sets his teeth strongly together, and shuts his mouth; for when this last symptom is found complicated with the pulse above mentioned, the three souls are destitute of help, and the patient will not live long.

There are epileptical persons who are not troubled with this symptom, but on the contrary open their mouths, and emit their breath like a thick gross vapour, their faces appearing as red as if coloured with

vermillion; these, though difficult to cure, may linger on for some time.

As for those whose hair stands on end, and who frothe at the mouth, being unable to swallow any medicine; who are melancholy, disconsolate, anxious, rattle in the throat, and make a noise like the moorhen, being also troubled with violent and convulsive motions, these persons are incurable, especially if besides the preceding symptoms you observe that they have a blackish visage, with the orb of the eye contracted, and the pupil enlarged, and if there happens a certain sweat, which adhering to the hair of the body forms a kind of tenacious drop that will not run off; but it is worst of all when these sweats are oily, it is all in vain to lend such patients assistance.

In a certain distemper, occasioned by the abundance of internal plenitude of malignant humours, the body swells, and there is a tension and pain; at the region of the stomach there is perceived a hardness, straitness, and dryness, accompanied with nausea and vomiting; at the same time there is felt a malignant and troublesome heat in the hands and feet.

It is a bad sign, if in this case the pulse is deep and slender, and the patient generally dies, especially when the stool and urine are sharp.

In certain other distempers, caused by the abundance and external plenitude of humours, and by internal heat, there frequently happens a vomiting, which is no bad sign; but if there is at the same time a diarrhoea, and the stools are very liquid, the distemper then is very great; and if the patient does not die, he will with great difficulty recover a good state of health. But if with a vomiting and diarrhoea together you find a strong and overflowing pulse, all endeavours to cure the patient will be to no purpose.

In a certain dropfy, which is a superficial swelling, occasioned by a humour or rising vapour that generally renders the breathing difficult, a pulse superficial and slippery is agreeable thereto: If it suddenly becomes small and slender, the disease is mortal; you will employ your skill in vain, for the patient will not recover.

In a certain distemper, wherein the patient has a dry cough, makes bloody water, and is dry and very lean, if you find the pulse strong consider well before you undertake the cure, for it will be very difficult.

In spitting of blood a deep and a weak pulse is good, if you find it full and strong it is mortal.

In an oppression of the breast, caused by any intemperies whatsoever, the slippery pulse is good; but there is no cure if it is sharp.

In the distemper called Tchung ngo, wherein there is a sudden swelling of the belly, the pulse short, tremulous and slender is good, but superficial and strong is very bad.

EXPLANATION.

According to the book called The Sources of Diseases, the tchung ngo is when a man having a good constitution, and by a bad regimen and excesses becomes very weak, and from thence very susceptible of foreign impressions, is struck with some malignant impression which makes his belly suddenly to swell, causes violent pains, and brings him to the point of death.

THE TEXT.

A slender and empty pulse is good in wounds attended with great loss of blood, but the full, strong, quick one is bad.

When the pulse is so short and tremulous at the extremity of the Cubitus, and at the wrist, that the beats are like the pricks of a bodkin, and the patient has fits of vomiting by intervals, the distemper arises from certain worms called Kou, and requires a speedy remedy: Quickly make use of the most efficacious medicines, says one version; the life is in great danger: Another version says, if the pulse is so quick that it is soft at the same time, the patient may be kept alive a good while longer.

EXPLANATION.

The book called The Sources of Diseases says, in the composition of the character, which is read Kou, there are three Tchong, that is to say, three worms that are in the same vessel Min, where they make war and feed upon each other; that which vanquishes the rest is very dangerous, and gnaws the Viscera of the patient; those who are attacked with it have frequent cardialgias, and something seems to gnaw them at the heart, the face frequently becomes bluish, and the eyes yellow, and several other extraordinary and irregular accidents of the same nature happen. This animal generally attacks the midriff first, whence ensues spitting or vomiting of blood; and if not prevented he will devour the Viscera called Tfang and Fou, and occasion death.

THE TEXT.

The pulse strong and overflowing in the attacks of poison is good, but it is dangerous if it is small and slender, especially if attended with vomiting of blood, for it is difficult to stop it perfectly, and death usually ensues.

EXPLANATION.

The pulse deep and slender is good in other vomitings of blood; there is none, but that occasioned by poison, where the strong and overflowing is thought to be good.

THE TEXT.

In short, generally speaking, to judge and pronounce more certainly, if the patient will die of his disease or not, there is nothing can be done better than to consult the pulse Tai chang; the patient will recover, if it is found to have motion and vigour; but if in this place the pulse is languishing and stops, he will then die.

EXPLANATION.

This is an inch and a half distant from the joint of the great toe.

REMARK.

The Chinese physicians at present never consult the pulse in this place, not even in men.

Prognosticks taken from the Inspection of the Patient.

It is a good sign if the inward corner of the eyes of the patient be yellow, he commonly recovers.

If the eyes having been swelled suddenly fall, he will not live long; the five Tfang, says the commentator, are spoiled.

The distemper will not be easily cured, when you perceive a blackish colour spread itself over the eyes, ears and nose of the patient; and if this colour reach-

es as far as the mouth, it is a hundred to one if he recovers; the stomach, says the commentator, is oppressed with the too great humidity of the kidneys.

When the face is yellow, the eyes violet or blackish, and the patient moves his arms in an unquiet and irregular manner, a malignant air has seized the stomach, and produced a mortal fermentation throughout the body; the stomach has oppressed the liver, says the commentator.

If the eyes are white when the face is blackish, the right kidney, called the Gate of Life, is quite spoiled, and the patient will die in about eight days.

When a patient's face is observed suddenly to change to a purple colour, and becomes by degrees more black, the liver and kidneys, says the commentator, no longer perform their functions.

The fate of the patient will be determined in ten days time, when the face becomes red and the eyes white, and there is at the same time a difficulty of breathing: If he gets over them safely he will recover; they are the lungs that suffer here, and the heat of the heart is too great, says the commentator.

It is a bad sign when the eyes become inwardly yellow, black, or white, and this reaches as far as the nose and mouth: The stomach, says the commentator, suffers from the moist intemperies of the liver.

The patient dies in about twelve hours time, when the mouth becomes yellow while the face is purple.

When the eyes are disturbed, and the teeth break, and become black, or when the face becomes of a sickly white, and the eyes turn black, these are all bad signs.

The patient will not live long, when he opens his mouth like certain fish, and cannot shut it again, and

the expiration is strong while the inspiration is very little.

When the patient's back is so stiff that he cannot move it, his eyes fixed and immoveable, looking only one way, and his lips dry and as it were parched, his visage swelled, and at the same time bluish or black, the disease is very dangerous, and will not be easily cured: If there is also a delirium, unquiet and convulsive motions, followed with the loss of speech, and accompanied with a certain cadaverous smell, the patient will not live long.

When the patient perceives an entire repletion throughout the body, and his back becomes of a purple colour, he will die in three days: The stomach is oppressed by the intemperies of the liver, says the commentator.

The distemper is very dangerous, when the feet and legs fail under a man, and the knees are much swelled; the patient seldom lives over ten days.

The disease is mortal, when the joints lose their motion, and become stubborn.

The patient cannot live long, when the lines in the palms of the hands are effaced.

The lips blackish, a cold sensation throughout the body, involuntary loss of urine, aversion to every kind of nourishment, are not good signs: The patient will die in four days, if they meet at the same time.

It is a bad sign, when the nails of the patient, both at hands and feet become of a purple colour, and afterwards black: The patient will die, if it remains for eight days, at least he cannot be easily cured: The liver, says the commentator, is decayed.

When the patient perceives a weight in the loins, pain in the back, uneasiness throughout the body, the

disease is in the bones, and the patient will die in five days.

When a sick person finds a great heaviness throughout the body, and has red urine, if these symptoms continue, the disease lies in all the muscles; the patient will not live above six days.

The patient will hardly pass over nine days, when the nails of the fingers and toes become blackish, and he is fretful, finding fault with every one that comes, and the joints losing their motion; but if the hairs stand on end, and become like hemp, he will die in half a day; in short, when the patient seems to grope for his garments, and talks of death, it is in reality not far off.

Diagnosticks and Prognosticks of the Distempers of the five Tsang, independent of the Pulse.

Of the Liver.

A weakness throughout the body, and especially in the arms and legs, a remarkable dimness of sight, tears falling continually, and without reason, the face swelled with blackish pimples, the tongue crooked, and of a purple colour; all these indicate the liver to be decayed, and the patient seldom lives over the eighth day.

The liver is disordered with repletion, when there is a pain in the region of the arm-pits, the eyes are red, and there are frequent passions, vertigoes, and deafness: This viscus must be unloaded by evacuations, and the cure may succeed.

A stiffness in the joints, and in the region of the arm-pits, dimness of sight, fears, and sighs without any evident cause, shew the liver to be disordered thro'

inanimation: If a cure is designed, the liver must be strengthened.

Of the Heart.

The heart is oppressed, and is as it were suffocated with heat, when the face becomes yellow, but of a deep colour, and mixed with black, when there is a stiffness at the shoulders, the eyes fixed upon one place, the hands swelled, the lines of the hands effaced, and the talk extravagant, and without ceasing; the patient seldom lives more than a day, when this is the case.

When the patient perceives a numbness and obtuse pain in the back, and yet laughs without a cause, perceiving from time to time an extraordinary dryness in the tongue; all this indicates a bad repletion which disorders the heart: Evacuations are necessary, and the physician should be cautious that he is not deceived in attributing the disease to inanition.

The disease proceeds from inanition, if the patient is melancholy and troubled, easily frightened, and pale; if he perceives a stiffness at the root of the tongue, and a pain reaching from the loins to the back; Cordials and comforting things are necessary, when this is the case.

Of the Stomach.

The stomach of a patient is entirely spoiled, when the skin of the whole body is rough, the feet swelled, and the belly also at the umbilical region, and at the same time the face yellow and puffed up, the excrements coming away involuntarily, and the position of the lips are changed: When the patient is in this condition, he will not live above twelve days.

When there is a swelling in the body, accompanied

with a constipation, a palsy in the feet, a heaviness throughout the body, when the patient eats much without being refreshed; all this shews a stomach disordered by a vitious plenitude, and makes evacuation necessary.

But the stomach is weak, and stands in need of strengthening medicines, when a swelling of the body is attended with a motion of the entrails, vomiting, continual indigestion, and a looseness.

Of the Lungs.

The lungs are entirely decayed, when the skin, hair, and nails are become dry, when the expiration is great, and very little inspiration, and when the lips are decayed, and the lines of them disappear, they becoming black, and like a half-burnt match: When this is the patient's case, he will not live long.

When the back, shoulders, and thighs are pained, and there is a cough, a difficulty of breathing, and windiness making its way upwards, then the lungs are affected with a bad plenitude, and it will be necessary to relieve them by evacuations as soon as possible, for all delays are dangerous.

When the respiration is weak, the voice small, attended with fits of coughing, and the spittle is mixed with blood, there is a great weakness and oppression, and it will be necessary to support and strengthen them before any method is used.

Of the Kidneys.

The kidneys are absolutely decayed, when the patient's face becomes black, the teeth ache, the sight grows dim, when there are spontaneous and plentiful

sweats with a shooting in the loins, when the skin is always moist, and the hair at the same time becoming dry: The patient will die in four days, when he is thus affected.

When there is a puffing up of the belly, a weight throughout the body, extraordinary sweating at meals, or immediately after, when the patient is very sensible of the least air, and the face and eyes become black and livid, when he has no mind to speak, and when he does speak, in a languishing manner; this shews that the kidneys are oppressed with a bad plenitude, therefore empty them as soon as possible.

When the patient feels extreme cold in the hypochondria, and a pain down the back, when there is at first a noise in the ears, and then a kind of deafness, when the urine is much altered, either in quantity or quality, they ought to be strengthened, for they very much require it.

Of pregnant Women.

A woman is with child, though not to outward appearance, when the pulse of the wrist is small, that of the joint slippery, that of the extremity of the Cubitus quick, and they remain so for a time, and without any other variation than what may be discovered at some intervals, when a few beats seem like the pecking of a bird that is feeding.

If the pulse is slippery and quick when you press your fingers gently upon it, and then if pressing more strongly it seems to be small, the woman is three months gone.

She is five months gone when the pulse is found to be slippery and quick: If it be in the right hand, the woman is big of a daughter; this is spoken of the pulse of the wrist, and this distinction of the right and left

hand ought to be applied to the slippery pulse of the joint before mentioned: As for that at the extremity of the Cubitus, it is sufficient to mind that there be no interruptions in its beats; this circumstance, joined to that which was said of the pulses of the wrist and joint, indicate being with child.

When the woman is four months gone, you may distinguish many ways whether she is pregnant of a boy or a girl.

1. The woman is big with a son, if the pulse is quick in the left hand; but with a daughter, if quick in the right hand.

2. She is big with a son, if the pulse is deep but full in the left hand; with a daughter, if the pulse is strong and superficial in the left hand; and she will have two boys, if the pulse is deep but full in both hands.

When a woman, who is with child, is gone her full time, and has a wandering pulse, and perceives pain in her belly and loins at the same time, she will be delivered in twelve hours. Some of the Chinese physicians say that there are three beats in the space of one inspiration: Others affirm that it beats but once during an inspiration, and pretend that this happens when the pulse is at the same time deep, slender, and slippery.

When a woman in labour feels an uncommon heaviness, and has sometimes a shivering, sometimes heat, and the under part of the tongue is hot, the upper part being cold, the infant is dead or dying, and the mother will die also without being delivered.

If the face of the woman in labour becomes red, and her tongue purple, she generally is delivered of a dead child; and she will also die, when there is froth at her mouth, and her lips and mouth are purple.

The mother will die, and the child live, when the face is purple, and the tongue red, and she frothes much at the mouth.

It is a good sign when a woman newly delivered has a slippery and moderate flow pulse; but she will not live long, if it is full, strong, tremulous, and close. If the pulse be small and deep, it is good; but it is bad, if hard and firm.

She will die, if the pulse is all in a flame, irregular, and very quick; but will recover, if the pulse is deep and slender, and continues still sensible, after pressing with the fingers so as to feel the bone.

F I N I S.



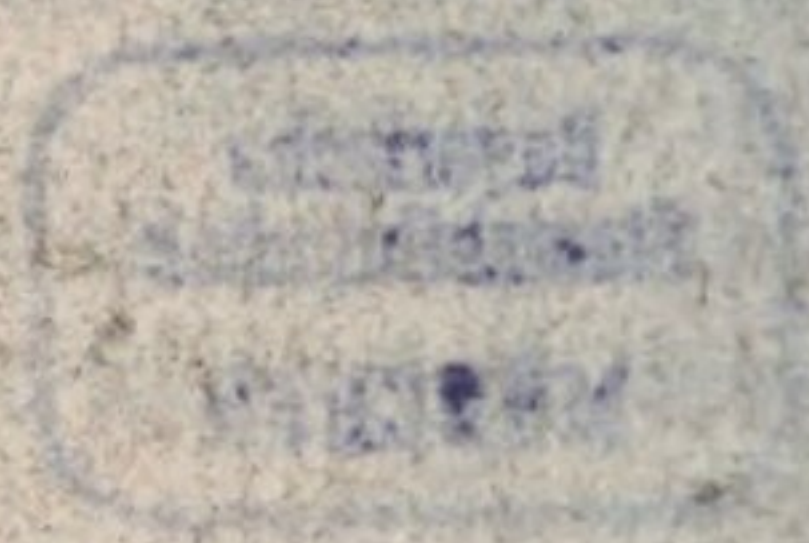
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The Chinese Traveller Containing A Geographical, Commercial and Political History of China ; With A particular Account of their Customs, Manners, Religion, Agriculture, Government, Arts ... ; To Which is Prefixed The Life Of Confucius, The celebrated Chines Philosopher ; Collected From Bd.: 2.

London (1772)

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